Lesson 3 equivalent ratios answers 6th grade

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Equivalent Ratios Match		
1:5	4:7	2:9
6:27	12:32	5:6
15:40	25:30	2:10
12:21	40:48	12:54
4:20	3:8	32:56

	Eq	uivalent Ra	atios (A)	
	Fill in the	blanks to make	equivalent ratios.	
1.	24:56 = 3:	2.	$44:20 = \: 5$	
3.	40:25 = 8:	4	$4:\_\_=20:15$	
5.	$5:9 = \: 72$	6.	: $8 = 5:2$	
7.	$\: 9 = 21:27$	8.	$\: 9 = 8:72$	
9.	6:1=12:	10.	$49: \ = 7: 12$	

<sup>14.</sup> 2:9 = 12:
<sup>16.</sup> : $5 = 21:35$
<sup>18.</sup> : 1 = 35 : 7
<sup>20.</sup> $55:60 = \_:12$







How to teach ratios 6th grade. What is a ratio grade 6. Lesson 3 equivalent ratios answers 6th grade i ready.

A ratio is a numerical comparison of two or more quantities that indicates their relative sizes. Help sixth-grade students demonstrate their understanding of the concept of a ratio by using ratio language to describe relationships between quantities in this lesson is designed to last one standard class period or 60 minutes. These are the

key elements of the lesson: Materials: Pictures of animalsKey vocabulary: ratio, relationship, quantityObjectives: Students will demonstrate their understanding of the concept of a ratio by using ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1 because for every two wings there was one beak." Take five to 10 minutes to do a class survey. Depending on the time and management issues you may have with your class, you can ask the questions and record the information yourself, or you can have the students design the survey themselves. Gather information such as: Number of people with shoelaces compared to fabric fastenerNumber of people with shoelaces compared to fabric fastenerNumber of people with shoelaces compared to fabric fastenerNumber of people with shoelaces compared to brown eyes in the classNumber of people with shoelaces compared to fabric fastenerNumber of people with shoelaces compared to fastenerNumber of people with shoelac "How many legs? How many beaks?" Then follow these steps. Show a picture of a cow. Ask students: "Today we will explore the concept of ratio, which is a relationship between two quantities. What we will try to do today is compare quantities in ratio format, which usually looks like 2:1, 1:3, 10:1, etc. The interesting thing about ratios is that no matter how many birds, cows, shoelaces, etc. you have, the ratio—the relationship—is always the same." Review the picture of the bird. Construct a T-chart—a graphical tool used for listing two separate viewpoints of a topic—on the board. In one column, write "legs," in another, write "beaks." Tell the students: "Barring any truly injured birds, if we have one beak. What if we have four legs, we have one beaks." Tell students that for birds, the ratio of their legs to beaks is 2:1. Then add: "For every two legs, we'll see one beak." Construct the same T-chart for the cows. Help students see that for every four legs, they'll see one head. Consequently, the ratio of legs to heads is 4:1. Use body parts to further demonstrate the concept. Ask students: "How many hands? (two)" On the T-chart, write 10 in one column, and 2 in the other. Remind students that the goal with ratios is to get them to look as simple as possible. (If your students have learned about greatest common factors, this is much easier.) Ask students: "What if we only had one hand? (five fingers) So the ratio of fingers to hands is 5:1." Do a quick check of the class. After students write the answers to these questions, have them do a choral response, where the class gives answers orally in unison for the following concepts: Ratio of eyes to heads Ratio of toes to feet Ratio of legs to feet Ratio of: (use survey answers if they are easily divisible: shoelaces to fabric fastener, for example) As students are working on these answers, walk around the class so that you can see who is having a hard time recording anything, and which students write their answers down quickly and confidently. If the class is struggling, review the concept of ratios using other animals. Free solutions to Big Ideas Math Grade 6 Chapter 3 Ratios and Rates Solution Key can get them on this page. As per your convenience we have provided the solutions in the pdf format. So, Download Big Ideas Math Answers Grade 6 Chapter 3 Ratios and Rates pdf for free of cost. Big Ideas Math Book 6th Grade Answer Key Chapter 3 Ratios and Rates pdf for free of cost. Relationships and so on. Check out the topics and practice the problems number of times and score highest marks in the exams. 6th Grade Ratios Homework or assignment in time. Performance Task Lesson: 1 Ratios Ratios Homework & Practice 3.1 Lesson: 2 Using Tape Diagrams Lesson 3.2 Using Tape Diagrams Homework & Practice 3.3 Lesson: 3 Using Ratio Tables Lesson: 5 Rates and Unit Rates Lesson: 6 Converting Measures Lesson: 6 Converting Measures Converting Measures Converting Measures Homework & Practice 3.6 Performance Task Ratios and Rates STEAM Video /Performance Task STEAM Video /Human Circulatory System." Then answer the following questions. 1. Enid says the heart pumps about 5 liters of blood each minute. How can you find the amount of blood the heart pumps for any given number of minutes? Answer: Enid says the heart pumps about 5 liters of blood each minute,  $5 \times 1 = 5$  liters we have multiply number of minutes with 5 2. Explain how you can estimate the amount of blood your heart pumps in one heart pumps in one heart pumps about 5 liters of blood each minute. liters of blood pumped by your heart in one minute. 3. The table shows the amounts of blood contained in several different types of blood wessels. How can you make meaningful comparisons of the amounts? Answer: 1 liter = 1000 ml The volume of Aorta and large arteries is 300 ml 300/1000 = 0.3 = 30% Small arteries = 0.4L 0.4 × 1000 = 400 ml = 40% 40% of blood contained in small arteries Small veins = 2.43qt 2.43 qt = 2.299L Large Veins = 0.24 qal 0.24 qal = 0.908L Performance Task. You will be able to use the concepts you learned to answer the questions in the STEAM Video Performance Task. You will be shown unit conversion mistakes in the following real-life situations. In each situations, you will analyze and correct the mistake in the unit conversion. How accurate must conversions be in real-life situations? Ratios and Rates answer? Question 1. Answer: 4: 12 Explanation: Count the red portion shown in the image out of 12 potions when we count we get Four-twelfths of the portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Portion of the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion of the rectangle is red Question 2. Answer: 6: 18 Explanation: Count the red portion 2. Answer: 6: 18 Explanation: Count the red portion 2. Answer: 6: 18 Explanation: Count the red portion 2. Answer: 6: 18 Explanation: Count the red portion 2. Answer: 6: 18 Explanation: Count the red portion 2. Answer: 6: 18 rectangle is red Question 3. Answer: 5:9 Explanation: Count the red portion shown in the image out of 9 potion when we count we get four out of nine of the portion of the Square is red Question 5. Answer: 6: 9 Explanation: Count the red portion shown in the image out of 9 potion when we count we get six out of the portion of the portio Rectangle is red Question 7. Answer: 4 : 12 Explanation: Count the red portion shown in the image out of 12 potion when we count we get four out of twelve of the portion of the Rectangle is red Question 9. Answer: 6 : 6 Explanation: Count the red portion shown in the image out of 6 potion when we count we get six out of six of the portion of the Rectangle is red Question 10. Work with a partner. In Exercises 1-9, which of the rectangles have the same portion of red tiles? Explain your reasoning. Answer: 6 : 6 portion of the rectangles have the same portion of red tiles Explanation: Count the red portion shown in the image out of 6 potions when we count we get six out of six of the portion of the tiles are blue. Answer: 5 : 6 Explanation: a ratio indicates how many times one number contains another. so 3 : 4 of the tiles are yellow. Answer: 3 : 4 Explanation: a ratio indicates how many times one number contains another. so 3 : 4 of the tiles are yellow. 4:5 Explanation: a ratio indicates how many times one number contains another. so 5:7 of the tiles are red Question 15. MODELING REAL LIFE Work with a partner. The soccer committee has 8 girls and 6 boys. The tennis committee has a greater portion of girls than the soccer committee has a greater portion of girls than the soccer committee has a greater portion of girls than the soccer committee has a greater portion of girls than the soccer committee has 8 girls and 8 boys. A friend tells you that the tennis committee has a greater portion of girls than the soccer committee has a greater portion of girls than the soccer committee has 8 girls and 8 boys. girls and 6 boys. The tennis committee is 9:8 Compare both the ratio of soccer committee is 9:8 Compare both the ratio of tennis committee is 9:8 Compare both te chapter. Think about what each term might mean and record your thoughts. ratio rate equivalent rates - Equivalent rates - Equivalent rates - Equivalent rates are rates that are equal. Equivalent ratio - Two ratios that have the same value are called equivalent ratios. Unit Rate - A unit rate is a rate with 1 in the denominator. Lesson 3.1 Ratios A ratio is a comparison of two quantities. second quantity. EXPLORATION 1 Writing Ratios Work with a partner. A science class has two times as many girls and 12 boys in the science class b. What comparisons can you make between your class and the science class? Can you determine which class has more girls? more boys? Explain your class and science class 22: 24 Thus there are more girls in science class. 20:12 Thus there are more girls in your class and science class 22: 24 Thus there are more girls in science class. in your classroom. Describe what each ratio represents. Answer: 36:42 - This represents number of students in science class and your class 20:12 - This represents number of boys in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of students in science class and your class 20:12 - This represents number of st ratio of iced tea to lemonade in a recipe is 3 : 1. You begin by combining 3 cups of iced tea with 1 cup of lemonade to the mixture. Does this change the taste of the mixture. b. Describe how you can make larger amounts without changing the taste. Answer: If the number of portions and the size of each portion change, you will have to find a conversion factor using a similar approach. Try It Write the indicated ratio using the coins in Example 1. Question 1. dimes to pennies. we know that A dime is worth 10 pennies. so the ratio is 1:10 Question 2. quarters to the total number of coins. Answer: 25:40 The number \(\frac{a}{b}) associated with the ratio a: b is called the value of the ratio. It describes the multiplicative relationship between the quantities in a ratio. Question 3. An elephant sanctuary contains adult and baby elephants. The ratio of adult elephants to baby elephants is 5: 1. Find and interpret the value of the ratios. To find an equivalent. Explanation: Two ratios that have the same value are called equivalent ratios. To find an equivalent ratio, multiply or divide both guantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 1 : 1 and 6 : 6 are Equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios are Not Equivalent fractions. ratios. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent. Explanation: Two ratios that have the same value are called equivalent ratios. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same number. It Then rate your understanding of the success criteria in your journal. WRITING AND INTERPRETING RATIOS Write the ratio. Then find and interpret the value of the ratio. Then find and interpret the value of the ratio. Then find and interpret the value of the ratio. given Question 8. dolphins : animals Answer: 5 : 0 of dolphins: animals by observing the picture given IDENTIFYING EQUIVALENT RATIOS Determine whether the ratios are equivalent. Explain your reasoning. Question 9. 2 : 3 and 24 : 36 Answer: The ratios are Equivalent. Explanation: Two ratios that have the same number. It is the same process as finding equivalent ratios. To find an equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 2 : 3 and 24 : 36 are Equivalent Question 10. 5 : 7 and 20: 28 Answer: The ratios are Equivalent. Explanation: Two ratios that have the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 5: 7 and 20: 28 are Equivalent Question 11. 3: 10 and 9: 25 Answer: The ratios are Not Equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. hence the 3: 10 and 9: 25 ratios are Not Equivalent. Question 12. DIFFERENT WORDS, SAME QUESTION Which is different? Find "both" answers. Answer: 5 to 3 Explanation: A ratio takes one number and divides it into another number to determine a decimal that can later be converted to a percentage if desired The ratio is 5 to 3. Question 14. You are kayaking at a pace of 63 feet every 12 seconds. Your friend's pace is 21 feet every 3 seconds. Are you and your friend kayaking at the same pace? If not, who is faster? Answer: No, Me and my friend kayaking are not at the same pace of 63 feet every 12 seconds Your friend's pace is 21 feet every 3 seconds So if I am kayaking at apace of 63 feet for every 12 seconds. then dividing 63 feet by 12 seconds we get 5.25 feet per second. In the same way friend is faster than me Question 15. DIG DEEPER! The ratio of Jet Ski rentals to boat rentals at a store is 7 : 2. If the number of boat rentals doubles and the number of Jet Ski rentals stays the same, then the number of Jet Ski rentals is how many times the number of Jet Ski rentals at a store is 7 : 2 If the number of boat rentals doubles then we get 2 × 2 = 4 boats the number of Jet Ski rentals stays the same that is 7 then the number of boat rentals is how many times the number of Jet Ski rental is divide 4 by 7 we get 0.571 times less than jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental is divide 4 by 7 we get 0.571 times less than jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 then the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that is 7 the number of Jet Ski rental stays the same that stays 2.2 we get 7 Question 2. 56.07 ÷ 8.9 Answer: 6.9 Explanation: Given 56.07 ÷ 8.9 so divide 56.07 by 8.9 we get 6.9 Question 3. (\sqrt [ 8.43 ] { 12.645 } ) so divide square root of 8.43 by 12.645 } ) so divide 56.07 by 8.9 we get 6.9 Question 3. (\sqrt [ 8.43 ] { 12.645 } ) so divide square root of 8.43 by 12.645 } )

the prime factors of the two numbers.  $2 \times 2 \times 3 \times 3 \times 5 = 5402 \times 3 \times 5 \times 5 = 450$  LCM of 540 and 450 are Find and list multiples of each number until the first common multiple is found. This is the lowest common multiple is found. This is the l 3780 Therefore, LCM(450, 540) = 2700 GCF of 540 and 450 are: 1, 2, 3, 5, 6, 9, 10, 15, 18, 20, 27, 30, 36, 45, 54, 60, 90, 108, 135, 180, 270, 540 Then the greatest common factor is 90. Question 10. Answer: By using the venn diagram 552, 576, 600, 624, 648, 672, 696, 720, 744, 768, 792, 816, 840, 864, 888 Multiples of 210: 210, 420, 630, 840, 1050, 1260 Therefore, LCM(24, 210) = 840 GCF of 24 and 210: The factors of 24 are: 1, 2, 3, 4, 6, 8, 12, 24 The factors of 210 are: 1, 2, 3, 5, 6, 7, 10, 14, 15, 21, 30, 35, 42, 70, 105, 210 Then the greatest common factor is 6. Concepts, Skills, & Problem Solving USING RATIOS You mix the amounts of iced tea and lemonade shown. Describe how you can make larger amounts without changing the taste. (See Exploration 2, p. 107.) Question 11. Answer: There are 2 iced tea and lemonade shown. Describe how you can make larger amounts without changing the taste. 2:3 There are 2 iced tea and 3 lemonade. So, we can make 2:3 iced tea and lemonade without changing the taste. WRITING RATIOS Write the ratio shows how much of one thing there is compared to another. Ratio shows how much of one thing there is compared to another. in the shown image. hence frogs to turtles is 2:5 Question 14 basketballs to soccer balls are 6:4 Explanation: A ratio shows how much of one thing there is compared to another. Ratios are 0:4 Question 15. calculators : pencils Answer: 2 : 6 Explanation: A ratio shows how much of one thing there is compared to another. Ratios are usually written in the form a:b. There are two calculators : pencils in the shown image. hence calculators : pencils are 2 : 6 Explanation: A ratio shows how much of one thing there is compared to another. Ratios are usually written in the form a:b. There are three shirts and six pants in the shown image. hence shirts are 3 : 6 Question 17. MODELING REAL LIFE Twelve of the 28 students in a class own a dog. What is the ratio of students who own a dog to students who do not? Answer: 12 : 28 Explanation: A ratio shows how much of one thing there is compared to another. Ratios are usually written in the form a:b. Given Twelve of the 28 students who do not have dogs are 28 hence the ratio of students who own a dog to students who do not is 12:28 Question 18. LOGIC Name two things that you would like to have in a ratio of 5: 1 but not in a ratio of 1: 5. Explain your reasoning. Answer: 5 students in 1 class gives the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationship that can be represented by the ratio 5:1 It is not possible to have 1 student in 5 classes. OPEN-ENDED Describe a real-life relationshi Explanation: A ratio shows how much of one thing there is compared to another. Ratios are usually written in the form a:b. hence 5 to 26 7 is 5:26 Question 21 is - 26 Question 20 is - 26 Question 21 is - 26 Question 20 is - 26 Question 20 is - 26 Question 21 is - 26 Question 20 is - 26 Question 20 is - 26 Question 21 is - 26 Question 21 is - 26 Question 20 is - 26 Question 20 is - 26 Question 21 is - 26 Question 20 is - 26 Question 20 is - 26 Question 20 is - 26 Question 21 is - 26 2 per 5 Answer: 2 : 5 Explanation: A ratio shows how much of one thing there is compared to another. Ratios are usually written in the form a:b. hence 2 per 5 is 2 : 5 Question 22. 7 : 1 Answer: 7 out of 1 Explanation: a ratio indicates how many times one number contains another. Hence 7 : 1 is 7 out of 1 Explanation: a ratio indicates how many times one number contains another. a given month, the ratio of sunny days is 5 times the number of days in April are 30. 4:1 4 × 6 = 24 days 1 × 6 = 6 days 24 + 6 = 30 days b. In another month, the number of sunny days is 5 times the number of rainy days. Write the ratio of sunny days b. In another month, the number of sunny days is 5 times the number of days in April are 30. 4:1 4 × 6 = 24 days 1 × 6 = 6 days 24 + 6 = 30 days b. In another month, the number of sunny days is 5 times the number of sunny days is 4 : 1. a. to rainy days. Answer: 5:1 Explanation: Given, In another month, the number of sunny days is 5 times the number of rainy days. The ratio of the sunny days is 5 : 1 IDENTIFYING EQUIVALENT RATIOS Determine whether the ratios are equivalent. Explanation: Two ratios are Not Equivalent. that have the same value are called equivalent ratios. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same number Equivalent. Explanation: Two ratios that have the same number. It is the same value are called equivalent ratio, multiply or divide both quantities by the same number. It is the same number number number number number. It is the same number num : 6 Answer: The ratios are Not Equivalent. Explanation: Two ratios that have the same value are called equivalent ratios. To find an equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 1 : 4 and 2 : 6 are Not Equivalent Ouestion 27.5: 3 and 15: 12 Answer: The ratios are Not Equivalent. Explanation: Two ratios that have the same number. It is the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 5 : 3 and 15 : 12 are Not Equivalent Question 28. 6 : 10 and 12 : 20 Answer: The ratios. To find an equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 6:10 and 12:20 are Equivalent. Explanation: Two ratios are not Equivalent. Explanation: Two ratios are not Equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 2 : 3 and 4 : 5 are not Equivalent. Explanation: Two ratios that have the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios are Not Equivalent. Explanation: Two ratios that have the same value are called equivalent ratio, multiply or divident. both quantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios are Not Equivalent. Explanation: Two ratios that have the same value are called equivalent ratios. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Hence the ratios 85 : 210 and 340 : 735 are Not Equivalent. WRITING EQUIVALENT RATIOS Write a ratio that is equivalent to the given ratio. Justify your answer. Question 33. 3 : 1 Answer: 6: 2 Explanation: The equivalent ratios of 3:1 is 6:2 Two ratios that have the same value are called equivalent ratios. The equivalent ratio of 7: 2 is 14:4 7 × 2: 2 × 2 = 14:4 Question 35. 6: 6 Answer: 12:12 Explanation: Two ratios that have the same value are called equivalent ratios. The equivalent ratio of 0:8 is 0:16 0 × 2: 6 × 2 = 0:16 WRITING EQUIVALENT RATIOS Fill in the blank so that the ratios are equivalent. Question 37. Answer: 18 Explanation: Since 3:9=6:X Then we know 9/3=X/6 Multiplying both sides by 6 cancels on the right  $6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$  Then solving for  $XX = 6 \times (9/3) = X$ . an equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Question 38. Answer: 24 Explanation: Since 2: 6 = 8: X Then we know 6/2 = X/8 Multiplying both sides by 8 cancels on the right  $8 \times (6/2) = (X/8) \times 88 \times (6/2) = X$  Then solving for  $X X = 8 \times (6/2) X = 24$  Therefore 2: 6 = 8: 24 Two ratios that
have the same number. It is the same process as finding equivalent ratio. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent ratio. Since X : 6 = 7 : 2 Then we know X/6 = 7/2 Multiplying both sides by 6 cancels on the left  $6 \times (X/6) = (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X X =  $6 \times (7/2) \times 6$  Then solving for X =  $6 \times (7/2) \times 6$  Then process as finding equivalent fractions. Multiply both the numerator and denominator by 2. Question 40. YOU BE THE TEACHER Your friend says that the two ratios are equivalent. Is your friend correct? Explain your reasoning. Answer: incorrect, The ratios are Not Equivalent. Is your friend says that the two ratios are equivalent. ratios. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the same process as finding equivalent. after add 4 each to the ratios Question 41. OPEN-ENDED A non-Newtonian liquid demonstrates properties of both a solid and a liquid. A recipe for a non-Newtonian liquid calls for 1 cup of water and 2 cups of cornstarch. Find two possible combinations of water and cornstarch that you can use to make a larger batch. Justify your answer. non-Newtonian liquid calls for 1 cup of water and cornstarch is 1 : 2 The possible combinations of water and cornstarch are You can multiply 3 to each number in the first ratio to obtain the numbers in the second ratio, the ratio sare equivalent. 1 × 3 : 2 × 3 = 3 : 6 You can multiply 5 to each number in the first ratio to obtain the numbers in the second ratio, the ratio sare equivalent. first ratio to obtain the numbers in the second ratio, the ratio of pop songs to your tablet. The ratio of pop songs to your tablet. The ratio of pop songs to rock songs is 5: 4. You download 40 pop songs to rock songs is 5: 4. You download 40 pop songs to rock songs is 5: 4. You download 40 pop songs to your tablet. rock songs is 5:4. You download 40 pop songs. Let number of rock songs be x 5:4:40 is  $x = 4 \times 40$  for x = 160/5 x = 32. Therefore, number of rock songs = 32. Question 43. PROBLEM SOLVING In the contiguous United States, the ratio of states that do not border an ocean is 7:9. How many of the states that do not border an ocean is 7:9. How many of the states that border an ocean is 7:9. How many of the states border an ocean is 7 Explanation: Given, the ratio of states that do not border an ocean is 7 and states that do not border an ocean is 7 and states that do not border an ocean is 7 and states that border an ocean is 7 explanation: Given, the ratio is (\\frac{4}{3}\). The second quantity in the ratio is (\\frac{4}{3}\). how many times the first quantity in the ratio? Explain your reasoning. Answer: The second quantity in the ratio is first quantity in the ratio is first quantity in the ratio is first quantity in the ratio. The definition of ratio is, the quantitative relation between two amounts showing the number of times one value contains or is contained within the other. So according to the definition of ratio we get: 4/3 = 1.33 So we can say that 4 contains 3, 1.3333 times in it. So the second quantity is 1.3333 times in it. constant speed travels 3 miles every 5 minutes. A car moving at a constant speed travels 12 miles every 5 minutes. Are the vehicles traveling at the same speed 0.6 miles per minute Explanation: Given A train moving at a constant speed travels 3 miles every 5 minutes. By a constant speed travels 3 miles every 5 minutes. By a constant speed travel of a constant speed trav dividing 3 miles by 5 minutes we get 0.6 miles per minute A car moving at a constant speed travels 12 miles every 20 minutes. by dividing 12 miles by 20 minutes we get 0.6 miles per minute Hence both vehicle have the same speed Question 46. CRITICAL THINKING To win a relay race, you must swim 200 yards before your opponent swims 1900 yards before your opponent speed Question 46. CRITICAL THINKING To win a relay race, you must swim 200 yards before your opponent swims 1900 yards before your opponent swims 1900 yards before your opponent speed Question 46. CRITICAL THINKING To win a relay race, you must swim 200 yards before your opponent swims 1900 yards before your opponent speed Question 46. CRITICAL THINKING To win a relay race, you must swim 200 yards before your opponent swims 1900 yards before your opponent speed Question 46. CRITICAL THINKING To win a relay race, you must swim 200 yards before your opponent swims 1900 yards yards. You swim at a pace of 50 yards every 40 seconds. Who wins the race? Justify your answer. Answer: Explanation: Given You swim at a pace of 10 yards every 40 seconds by dividing 50 yards every 40 seconds. Who wins the race? 8.5 seconds. By dividing 10 yards by 8.5 seconds we get 1.17 yards per second You swim at a pace of 50 yards every 40 seconds for completing 200 yards in 160 seconds before your opponent completes 190 yards at 162.3 seconds Question 47. DIG DEEPER! There are 3 boys for every 2 girls in a dance competition. 3:2=5 so girls are 2:5 so set up the proportion 2/5=x/9 5x=18 x=3.6 girls another way you can look at it is because there are 3 boys for every 2 girls, add 2 more girls, you'll get 3 more boys that makes the total of 10 people so 9 is impossible Question 48. GEOMETRY Use the blue and green rectangles. a. Find the ratio of the length o green rectangle. Repeat this for width, perimeter, and area. Answer: The ratio of the length of the green rectangle is 3:6 Perimeter of the rectangle is 3:6 Perimeter of the rectangle is 2:4 The ratio of the length of the green rectangle is 2:4 The ratio of the length of the green rectangle is 2:4 The ratio of the width of the green rectangle is 3:6 Perimeter of the rectangle is 2:4 The ratio of the length of the green rectangle is 2:4 The ratio of the solution of the green rectangle is 2:4 The ratio of the solution of the green rectangle is 3:6 Perimeter of the rectangle is 2:4 The ratio
of the solution of the solution of the green rectangle is 3:6 Perimeter of the solution of the soluti = 12 + 8 = 20 Ratio of perimeter of blue rectangle is 6 : 24 b. Compare your ratios in part(a). Answer: The ratio of the length of the length of the length of the green rectangle is 6 : 24 b. Compare your ratios in part(a). rectangle is 2 : 4 equivalent to 1 : 2 The ratio of the width of the green rectangle to the green rectangle is 3 : 6 equivalent to 1 : 2 Ratio of Area of blue rectangle is 6 : 24 equivalent to 1 : 2 Ratio of Area of Brate Area the side lengths of a triangle is 2:3:4. The shortest side is 15 inches. Let x = the first side y = the second side z = the third side We know that x/y = 2/3 y = 1.5x x/z = 2/4 z =2x x = 15 inches Substitute the value of x in both the equations y = 1.5(15) = 22.5 in z = 2(15) = 30 in Now find the perimeter of the triangle P = x + y + z P = 15 + 22.5 + 30 = 67.5 inches Question 50. PROBLEM SOLVING A restaurant sells tokens that customers use to play games while waiting for their orders. a. Which option is the best deal? Justify your answer. b. What suggestions, if any, would you give to the restaurant about how it could modify the prices of tokens? Answer: It would be 90 tokens you save  $5 = 12.5 \ 0.50 \ 25 \ 0.50 \ 25$ boys joined the class, how many girls would need to join for the ratio of boys to girls to remain the same? Justify your answer. Answer: Given, There are 12 boys and 10 girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys to girls in your gym class. 12/10=6/5 6 boys joined: 18/(of girls)=6/5, #of girls=18×5/6=15 5 more girls would need to join for the ratio of boys joined: 18/(of girls)=6/5, #of girls=18 model, called a tape diagram, to represent the relationship between two quantities in a ratio. EXPLORATION 1 Using a Tape Diagram models the lengths of two snowboarding trails. a. What can you determine from the tape diagram? Answer: We determine from the tape diagram models the lengths of two snowboarding trails. rectangle and the expert trial has four rectangles. b. Choose a length for one of the trails. What conclusions can you make from the tape diagram? Explain your reasoning. Answer: Let the length of the expert trial is 4 × 10 = 401 : 4 c. Suppose you know the combined length of the trails or the difference in the length of the trails. Explain how you can use that information to find the length of one rectangle is 10. Now let us combine the length to find the length of the expert trail contains 4 rectangles. So, multiply 10 with 4.4 × 10 = 40 Example: The tape diagram represents the ratio of gifts received to gifts given. You received 4 gifts. You can use tape diagram represents the ratio of gifts received to gifts given. You received 4 gifts. How many gifts did you give? Answer: 1 : 4 Explanation given The tape diagram represents the ratio of gifts received to gifts received 4 gifts the ratio by observing the given image is 1 : 4 hence you gave 1 gift Question 2. There are 8 bones in a small snake. The small snake has 150 bones. How many bones does the large snake have? Answer: 400 Explanation Given, There are 8 bones in a large snake for every 3 bones in a small snake. The small snake has 150 bones. 150/3 = 50 bones 50 × 8 = 400 bones. Question 3. WHAT IF? Repeat Example 3 when the ratio of your monthly allowance to your friend's monthly allowance is 2 to 3. Self-Assessment for Concepts & Skills Solve each exercise. Then rate your understanding of the success criteria in your journal. Question 4. STRUCTURE What ratio is represented by the tape diagram to model the ratio 8 : 16? Explain your reasoning. Answer: Question 5. REASONING You are given a tape diagram and the total value of the parts. How can you find the value of 1 part? Answer: USING A TAPE DIAGRAM Describe two ways that you can represent the ratio of winning tickets to losing tickets. How many of each kind of tickets are in the bag? Question 7. 35 tickets; 1 to 4 Answer: 7: 28 Explanation: Number of vinning tickets are 7: 28 We get 1: 4 Thus the answer is 7: 28 Question 8. 80 tickets; 2: 8 Answer: 16: 64 Explanation: Total number of tickets = 80 The ratio of winning tickets to losing tickets are 16: 64 Question 9. The tape diagram represents the ratio of t numbers of planets in two different solar systems. There are 8 planets in Solar System B. How many planets are in Solar System A contains 3 rectangles 3 : 4 Given that There are 8 planets in Solar System A contains 3 rectangles 3 : 4 Given that There are 8 planets in Solar System B. How many planets are in Solar System A contains 3 rectangles 3 : 4 Given that There are 8 planets in Solar System B. How many planets in Solar System B. How many planets in Solar System B. Solar System B. How many planets in Solar System B. How many × 2 = 6 Therefore the solar system A contains 6 planets. Question 10. You and your friend play an arcade game. You score 5 points for every 9 points that your friend score? Answer: Given You and your friend play an
arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play and your friend play an arcade game. You score 5 points for every 9 points that your friend play an arcade game. You score 5 points for every 9 points that your friend play and your friend that your friend scores. You score 320 points less than your friend. Each time you score you gain 4 less points than your friend so, you can do this equation 9x - 320 = 5x 9x - 5x = 320 4x =gold, silver, and bronze in a ratio of 2:2:5. How many of each medals won = 18 Ratio of gold, silver and bronze = 2:2:5 Let, x be the original number. Therefore, Gold medals = 2x Silver medals = 2x Bronze medals = 5x According to given statement 2x + 2x + 5x = 18 9x = 18 x = 2 Gold medals = 2x = 2(2) = 4 Silver medals = 5x = 5(2) = 10 Using Tape Diagrams Homework & Practice 3.2 Review & Refresh Determine whether the ratios are equivalent. Explanation: Two ratios that have the same value are called equivalent ratio. To find an equivalent ratio, multiply or divide both quantities by the same number. It is the s are Equivalent. Explanation: Two ratios that have the same number. It is the same process as finding equivalent ratio, multiply both the numerator and denominator by 2. Hence the ratios 12 : 18 and 2 : 3 are Equivalent. Question 3. 56 : 81 and 7: 9 Answer: The ratios are not Equivalent. Explanation: Two ratios that have the same number. It is the same process as finding equivalent ratios. Multiply both the numerator and denominator by 2. Hence the ratios 56: 81 and 7: 9 are not Equivalent. Question 4. 2 : 12 and 6 : 24 Answer: The ratios are not Equivalent ratio, multiply or divide both quantities by the same number. It is the same number and denominator by the same number. 2. Hence the ratios 2 : 12 and 6 : 24 are not Equivalent. Multiply. Write the answer in the simplest form. Question 5. \(\frac{5}{7}\) For fraction multiply the numerators and then multiply the nume the numerator and denominator by the Greatest Common Factor of 35 and 70 using GCF(35,70) =  $35 \cdot 35 + 35$  divided by  $70 \div 35 = \langle \frac{1}{2} \rangle$  herefore:  $\langle \frac{1}{2} \rangle$  herefor denominators to get  $1\times33\times4=312$  This fraction can be reduced by dividing both the numerator and denominator by the Greatest Common Factor of 3 and 12 using GCF(3,12) =  $33\div3$  divided by  $12\div3=\langle(\frac{1}{4})\rangle$  we get  $\langle(\frac{1}{4})\rangle$  and  $12\times3=\langle(\frac{1}{4})\rangle$  a  $\{8\}$  = \(\frac{1}{2}\) Answer: 13 \(\frac{1}{2}\) = \(\frac{5}{2}\) = \(\frac{5}{2}\) = \(\frac{5}{16}\) = 13 \(\frac{7}{16}\) Ouestion 8. Melissa earns \$7.40 per (\frac{215}{16}\) = 13 \(\frac{7}{16}\) = 13 \(\frac{7} hour working at a grocery store. She works 14.25 hours this week. How much does she earn? A. \$83.13 B. \$105.45 C. \$156.75 D. \$105.45 C. \$156.75 D. \$105.45 C. \$105.45 C. \$105.45 Thus Melissa earns \$7.40 per hour working at a grocery store. She works 14.25 hours this week. 14.25 hours this week. 14.25 × 7.40 = \$105.45 Thus Melissa earns \$7.40 per hour working at a grocery store. She works 14.25 hours this week. Problem Solving USING A TAPE DIAGRAM Use the tape diagram in Exploration 1, p. 115.) Question 9. The beginner's trail, there is only one rectangle. For Expert Trail, there are 4 rectangles. Then in total, we have 5 rectangles. We know that the combined length is 200 meters, then the 5 rectangles are equivalent to 200 meters. Then each rectangle, then it is:  $4 \times 40m = 160m \log 10^{-1}$ be equivalent to: 1200m/5 = 240m Now, we know that the beginner's trail has one rectangle, then the length of the beginner's trail is 240 meters long. The expert's trail has 4 rectangles, then it is: 4×240m = 960m long. Question 11. The combined length of the trails is 2000 meters. How long is each trail? Answer: For the beginner's trail, there is only one rectangle. For Expert Trail, there are 4 rectangles. Then in total, we have 5 rectangles. We know that the combined length is 2000 meters, then the 5 rectangle will be equivalent to 2000 meters. Then each rectangle will be equivalent to 2000 meters. beginner's trail is 400 meters long. The expert's trail, there is only one rectangle. For Expert Trail, there are 4 rectangles. Then in total, we have 5 rectangles. We know that the combined length is 750 meters, then the 5 rectangles are equivalent to 750 meters. Then each rectangle, then the length of the beginner's trail is 150 meters long. The expert's trail has 4 rectangles, then it is: 4×150m = 600m long. INTERPRETING A TAPE DIAGRAM The tape diagram represents the ratio of the time you spend tutoring? Question 13. Answer: So you have one block, and your friend has two. We know that you work for 3 hours, this means that your only block must represent 3 hours. And all the blocks represent the same amount of time, then each one of the two blocks of your friend has 5. Using the same reasoning as above, we can conclude that each block represents 3 hours, and your friend has 5 of them this means that he tutored for: 5×3 hours = 15 hours DRAWING A TAPE DIAGRAM A bag contains red marbles in the bag. Find the number of red marbles in the bag. Question 15. 10 red marbles; 5 to 1 Answer: red : blue=5:1 red/blue=5 red= 10 so blue= 2 Question 16. 3 red marbles; 3 : 7 Answer: red : blue=3:7 red/blue=3/7 red= 3 so blue= 9 Question 17. 12 red marbles; 3 : 7 Answer: red : blue=3:7 red/blue=3/7 red= 3 so blue= 9 Question 17. 12 red marbles; 3 : 7 Answer: red : blue=3:7 red/blue=3/7 red= 3 so blue= 9 Question 18. 6 red marbles; 2 for every 5 Answer: red : blue=2:5 red/blue=3/7 red=3 so blue= 9 Question 18. 6 red marbles; 2 for every 5 Answer: red : blue=3:7 red/blue=3/7 red=3 so blue= 9 Question 18. 6 red marbles; 2 for every 5 Answer: red : blue=3:7 red/blue=3/7 red=3 so blue= 9 Question 18. 6 red marbles; 2 for every 5 Answer: red : blue=3:7 red/blue=3/7 red=3 so blue=3/7 red=3/7 red=3/ 2×3: 5×3 red= 6 so blue= 15 Question 19. 18 red marbles; 3: 4 Answer: red: blue=6:9 red/blue=12/16 red= 12 so blue= 16 USING A TAPE DIAGRAM A bowl contains blueberries and strawberries. You are given the total number of berries in the bowl and the ratio of blueberries :- 16 ration :- 3:1 no of strawberries :- 16 ration :- 3:1 no of strawberries :- 18 ration :- 3:1 no of s strawberries :- 3x = 10 strawberries :- 2x = 2(2) = 4 Question 23. 12 berries; 1 to 2 Answer: no of strawberries :- 1x = 1(4) = 4 Question 24. 20 berries; 4 : 1 Answer: no of strawberries :- 1x = 48 x = 4 no of strawberries :- 3x = 3(4) = 16 Question 25. 48 berries :- 9x = 3(4) = 36 Question 26 due berries :- 9x = 48 x = 4 no of strawberries :- 3x = 3(4) = 12 no of blueberries :- 3x = 3(4) = 36 Question 26 due berries :- 9x = 3x + 9x = 48 here 3x = 4 no of strawberries :- 3x = 3(4) = 12 no of blueberries :- 3x = 3(4) = 16 Question 26 due berries :- 3x = 48 x = 4 no of strawberries :- 3x = 3(4) = 12 no of blueberries :- 3x = 3(4) = 12 no of blueberries :- 3x = 3(4) = 16 Question 26 due berries :- 3x = 3(4) = 16 Ques 46 berries; 11 for every 12 Answer: no of strawberries :- 12x = 46 x = 2 no of strawberries :- 11x = 146 23x = 46 x = 2 no of strawberries :- 11x = 12(2) = 24
no of strawberries :- 11x = 12(2) = 24 no of strawberries :- 11x = 12(2)bulbs for planting to bulbs for cooking. You use 6 bulbs for cooking. Each bulb has 8 cloves. How many cloves of garlic will you plant? Answer: Given, You use 6 bulbs for cooking. You use 6 bulbs for cooking. Each bulb has 8 cloves. How many cloves of garlic will you plant? bulb has 8 cloves. 6: 8 6 × 6 = 36 36 × 8 = 288 Thus you plant 288 cloves of garlic. Question 28. MODELING REAL LIFE Methane gas contains and hydrogen atoms in the ratio of 1: 4. A sample of methane gas contains 92 hydrogen atoms. How many carbon atoms are in the sample? How many total atoms are in the sample? Answer: Methane: 1 carbon and 4 hydrogens A sample of methane gas contains 92 hydrogen atoms. 1: 4:: x: 92 x = number of carbons x = 92/4 x = 23 carbons Total atoms = hydrogen atoms + carbon atoms = 92 + 23 = 115 atoms Question 29. MODELING REAL LIFE There are 8 more girls than boys in a school play. The ratio of boys to girls is 5: 7. How many boys and how many girls are in the play? Answer: Given, There are 8 more girls than boys in a school play. The ratio of boys to girls is 5:75x = 5(4) = 20 boys 7x = 7(4) = 28 girls To find how many more girls there are 8 more girls there 8 m girls than boys in the school play. Question 30. DIG DEEPER! A baseball team sells tickets for two games. The ratio of sold tickets for the first game? Answer: 1260 tickets were sold for the first game? Answer: 1260 tickets were sold for the first game. on the first game Explanation: For the second game, the ratio was 13:2. Total ratio = 13 + 2 = 15 There were 240 unsold tickets for the second game. Let the total number of tickets for the second game. Let the total number of tickets for the second game. Let the total number of tickets for the second game. Let the total number of tickets for the second game. Let the total number of tickets for the second game. first game is equal to total number of tickets for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold for the first game was 7: 3 Total ratio 7 + 3 = 10 Number of tickets sold f have \$150 in a savings account and you have some cash. The tape diagram represents the ratio of the amounts of money. You want to have \$150 in a savings account as you have in cash. How much of your cash should you deposit into your savings account? Answer: \$200 Explanation: We know that: You have \$150 in a savings account as you have in cash. How much of your cash should you deposit into your savings account? account. This is represented with two tiles. Then each tile represents: \$150/2 = \$75 And in cash you have \$275 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. You want to deposit a quantity such that you have \$375 in cash. cash. Suppose that you move a quantity X from cash to the savings account, then now we have the situation: Sav. Acc. = \$150 + X Cash = \$375 - X And we want that: Sav. Acc. =  $$750 - 2 \times X \ 3 \times X = $75$ account. Question 32. DIG DEEPER! A fish tank contains tetras, guppies, and minnows. The ratio of tetras to guppies is 1 : 3. There are 60 fish in the tank. How many more tetras are there than minnows. The ratio of tetras to guppies is 4:2. The ratio of minnows to guppies is 4:2, or reducing, 2:1 m = g/3 Also, total there are 60 fish t + g + m = 60 2g + g + g/3 = 60 Now finding t and m: m = g/3 = 18/3 = 6 m = 6 t = 2g t= 2(18) t = 36 There are 36 tetras and 6 minnows. So, there are 36 - 6 = 30 more tetras than minnows EXPLORATION 1 Making a Table of Equivalent Ratios Work with a partner. You buy milk that contains 180 calories per 2 cups. a. You measure 2 cups of the milk for a recipe and pour it into a pitcher. You buy milk that contains 180 calories per 2 cups. to show the numbers of calories and cups in the pitcher as you add the milk. b. Describe any relationships you
see in your table. c. Describe ways that you can find equivalent ratios using different operations. Answer: EXPLORATION 2 Creating a Double Number Line Work with a partner. a. Represent the ratio in Exploration 1 by labeling the increments on the double number line below. Can you label the increments in more than one way? b. How can you use the double number line to find the number of calories in 3 cups of milk? 3.5 cups of milk? Answer: Lesson 3.3 Using Ratio Tables You can find and organize equivalent ratios in a ratio table. You can generate a ratio table by using repeated addition or multiplication. Try It Find the missing values in the ratio table. Then write the equivalent ratios. • multiplying or subtraction or division. In summary, you can find equivalent ratios by: • adding or subtracting quantities in equivalent ratios. • multiplying or dividing each quantity in a ratio by the same number. Try It Find the missing values in the ratio table. Then write the equivalent ratios are 24:2 = 12:1 48:4 = 12:1 36:3 = 12:1 48:4 = 12:1 36:3 = 12:1 Question 5. WHAT IF? You eat 21 crackers. How much sodium do you consume? Answer: Add the middle two columns 120 + 20 = 140 18 + 3 = 21 crackers Thus you consume 140 mg sodium. Self-Assessment for Concepts & Skills Solve each exercise. Then rate your understanding of the success criteria in your journal. COMPLETING A RATIO TABLE Find the missing values in the ratio table. Then write the equivalent ratio of 2:8 are 4:12, 6:18 Question 6. Answer: The missing values in the ratio are 56, 7, 20 The ratio is 2:8 The equivalent ratio of 2:8 are 14:56, 7:28, 5:20 Question 8. WRITING Explain how creating a ratio table using repeated addition is similar to creating a ratio table using multiplication. Answer: Ratio tables are constructed in a special way. Each pair of values in the first column by to get the values in the second column. Question 9. You mix 7 tablespoons of vinegar for every 4 tablespoons of baking soda to produce a chemical reaction. You use 15 tablespoons of vinegar for every 4 tablespoons of baking soda to produce a chemical reaction. You use 15 tablespoons of vinegar for every 4 tablespoons of baking soda. tablespoon of baking soda. Case 1: Tablespoon of vinegar taken = 7 Tablespoon of baking soda taken = 4 The ratio between v and b = 7:4 Case 2: Tablespoon of baking soda taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = x Tablespoon of baking soda taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of baking soda taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of baking soda taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 15 The ratio between v and b = 7:4 Case 2: Tablespoon of vinegar taken = 10. You make a carbonated beverage by adding 7 ounces of soda water for every 3 ounces of regular water. Your friend uses 11 ounces of soda is the ounce of soda is the ounce of soda water for every 4 ounces of soda water for every 4 ounces of soda water for every 4 ounces of soda water for every 5 ounces of soda water for every 4 ounces of soda water for every 6 ounces of soda water for every soda divided by the sum of the soda and water. The proportion of soda in the first beverage 7/(7+3) = 7/10 = 0.7 Therefore the second beverage is more carbonated. Using Ratio Tables Homework & Practice 3.3 Review & Refresh A bag contains green tokens and black tokens. You are given the number of green tokens: 4 for every 1 Answer: no of green tokens: 4x = 4(1) = 4 no of black tokens: - 1x = 1() = 1 Question 2. 6 green tokens; 2 : 7 Answer: no of green tokens:- 2x no of black tokens:- 7x = 24 13x = 24 x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 5x = 24/13 no of green tokens:- 8x = 8(24/13) = 14.7 no of black tokens:- 8x = 8(24/13) = 14.7 no of blac 5(24/13) = 9.23 Question 4. 36 green tokens: 3x = 36/7 no of black tokens: 4x = 36 7x = 36 x = 36/7 no of black tokens: 4x = 36/7 no of black tok 5, 9, 15, 45 The factors of 100 are: 1, 2, 4, 5, 10, 20, 25, 50, 100 Then the greatest common factor is 5. Evaluate the expression. Question 8.  $35 - 2 \times 42$  Answer:  $12 \div (1 + 33 - 24)$  Answer: -3). 2] 82 ÷ [8.2] 82 ÷ 16 64 ÷ 16 = 4 Find the perimeter of the rectangle = 6 yd Perimeter of the rectangle = 21 + 2w P = 2(8) + 2(6) P = 16 + 12 P = 28 Thus the perimeter of the rectangle = 1 × w 48 = 8 × x x = 48/8 = 6 x = 6 yd Thus the perimeter of the rectangle = 1 × w 48 = 8 × x x = 48/8 = 6 x = 6 yd rectangle = 28 yards Question 12. Answer: Given Area = 132 sq. mm Length = 12 mm Width = x Area of the rectangle = 11 x = 11 mm Thus the width of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$ 
Thus the perimeter of the rectangle =  $12 \times x x = 132/12 = 11 \times x = 11 \text{ mm}$  Thus the perime Problem Solving USING A RATIO TABLE Use a ratio table to find the number of calories in the indicated number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of calories in the indicated number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups of milk from Exploration 1, p. 121.) Question 13. 16 cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find the number of cups a ratio table to find table to find the number of cups a ratio table to find table to Question 14. 18 cups Answer: You buy milk that contains 180 calories per 2 cups. 1 cup = 180/2 = 90 calories 18 cups = 1620 calories per 2 cups. 1 cup = 180/2 = 90 calories 2. 100 = 180/2 = 90 calories 18 cups = 1620 calories 2. 100 = 180/2 = 90 calories 2. 100 = 180/2 = 90 calories 18 cups = 1620 calories 2. 100 = 180/2 = 90 calories 2. 100 = 180/2 =the ratio table. Then write the equivalent ratio is 1:5 The equivalent ratio is 1:5 The equivalent ratio is 3:5 The equivalent ratio is 1:7,3:2118: 126 Question 20. Answer: Question 21. Answer: Question 22. YOU BE THE TEACHER Your friend creates a ratio table for the ratio 5: 3. Is your friend is incorrect. Because 125: 27 is not the equivalent ratio of 5: 3 COMPLETING RATIO TABLES Complete the ratio table to solve the problem. Question 23. For every 3 tickets you sell, your friend sells 4 tickets. You sell a total of 12 tickets. How many tickets does your friend sells 2 printers for every 5 computers. The store sells 40 computers. How many tickets does your friend sells 16 tickets Thus the ratio is 3 : 4 So divide 12 by 3 = 4 and sells 16 tickets. How many tickets and sells 16 tickets and sells 16 tickets. printers does the store sell? Answer: Let us think of 2 printers for every 5 computers as a set. First let us determine hoe many sets were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers were sold to get to 40 computers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 8 2x = 2(8) = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 printers 5x = 40 x = 16 This means 16 p pays \$60. How much does first place pay when second place pays \$36? Answer: \$60 Explanation: Given, First and second place pays \$60. Let x be the pay of the first place when the second place pays \$36 100/60 = x/36 x = \$60 Question 26. A grade has 81 girls and 72 boys. The grade is split into groups that have the same ratio of girls to boys as the whole grade. How many girls are in a group that has 16 boys 81 girls are in a group that have the same ratio of girls to boys as the whole grade. We have to find how many girls are in a group that has 16 boys 81  $: 72 = x : 16 \ 16 \times 81 = 1296 \ 1296 \ 72 = 18$  Therefore the value of girls numbers is 18. The new ratio will be 18 : 16 USING A DOUBLE NUMBER LINE Find the missing quantity in the double number line. Question 27. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 27. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 16 Question 28. Answer: The equivalent ratio of 460 : 4 is 1840 : 4 is 184 PROBLEM SOLVING A company sets sales goals for employees each month. a. At her current pace, how many items will Kristina sell in 28 days? Is she on track to meet the goal? Explain. Answer: Question 30. MODELING REAL LIFE A gold alloy contains 15 milligrams of gold for every 4 milligrams of copper. A jeweler uses 48 milligrams of gold. if 48 milligrams of gold in the alloy. How much gold for every 4 milligrams of copper, there are 15 milligrams of gold. if 48 milligrams of copper are used, we can separate them in "sets" of 4 milligrams. We have 48/4 = 12 sets. And for each one of these 12 sets, there are 15 milligrams of gold, then the total amount of gold in the alloy is: 12×15mg = 180 mg Question 31. MODELING REAL LIFE You make candles by adding 2 fluid ounces of scented oil for every 22 fluid ounces of wax. Your friend makes candles by adding 3 fluid ounces of the same scented oil for every 37 fluid ounces of wax. Whose candles are more fragrant? Explain your reasoning. Answer: Your candles are more fragrant? Explain your reasoning. Answer: Your friend makes candles are more fragrant? makes candles by adding 3 fluid ounces of the same scented oil for every 37 fluid ounces of wax. Compare 2/22 and 3/37 2/22 > 3/37 By this we can say that your candles are more fragrant. Question 32. MODELING REAL LIFE A mint milk shake contains 1.25 fluid ounces of milk for every 4 ounces of ice cream. A strawberry milk shake contains 1.75 fluid ounces of milk for every 5 ounces of ice cream. Which milk shake is thicker? Explain. Answer: CRITICAL THINKING Two whole numbers A and B satisfy the following conditions. Find A and B satisfy the following conditions. 18 A : B = 12 : 18 Question 34. A + B = 44 A : B is equivalent to 4 : 7. Answer: Let A = 4x = 44/11 x = 44 x = 44/111 x = 44 x $5(3) = 15\ 33 - 15 = 18\ A: B = 33: 15\ Question\ 36.\ A - B = 25\ A: B is\ equivalent\ to\ 13: 8.$  Answer: Let  $A = 13x\ Let\ B = 8x\ 13x - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x\ - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x\ - 8x = 25\ 5x = 25\ x = 5\ A = 13x\ Let\ B = 8x\ 13x\ - 8x\ A = 13x\ Let\ B = 8x\ 13x\ - 8x\ A = 13x\ Let\ B = 8x\ 13x\ - 8x\ A = 13x\ Let\ B = 8x\ 13x\ - 8x\ A = 13x\ Let\ B = 8x\ 13x\ - 8x\ A = 13x\ Let\ B = 8x\ 13x\ A = 13x\ Let\ B = 13$ totaling 12 grams. a. Do you think it is possible to find the number of calories you consume? Explain your reasoning. Answer: There are 161 calories in 12 grams. We need to
find out how many calories in 12 grams. We need to find out how many calories in 28 grams. We need to find out how many calories in 12 grams. We need to find out how many calories in 12 grams. We need to find out how many calories in 12 grams. We need to find out how many calories in 12 grams. We need to find out how many calories in 12 grams. We need to find out how many calories in 12 grams. 1932/28 x = 69 There are 69 calories in 12 grams b. How many cashews are in one serving? Answer: Divide 161 by 28 to get the calorie count for one gram Multiply that by 12 to work out how many calories you have eaten in the 9 cashews 161/28 = 5.75 5.75 x 12 = 69 Question 38. REASONING The ratio of three numbers is 4 : 5 : 3. The sum of the numbers is 54. What are the three numbers? Answer: Let it be x. 4x + 5x + 3x = 54/12 x = 4.5 Now  $4x = 4 \times 4.5 = 18$   $3x = 3 \times 4.5 = 12.5$  Question 39. CRITICAL THINKING Seven out of every 8 students surveyed own a bike. The difference between the number of students who own a bike and those who do not is 72. How many students were surveyed? Answer: So if x people were surveyed, 7/8 people were surveyed, 7/8 people were surveyed, 7/8 x = 72 Let us simply  $3/4 \times x = 72$  Let us simply  $3/4 \times x$ bug collection for science class. You find 5 out of every 9 bugs in the collection. You find 4 more bugs than your classmate. How many bugs are in the collection? Answer: Let b represent the total amount bugs.  $5/9 \times b = 4/9 \times b = 4 \times 9 = 4 \times 9 = 36$  There are 36 bugs in the collection. You find 4 more bugs than your classmate. How many bugs are in the collection? every 8 hours you spend shoveling snow. You earn \$60 for every 5 hours you spend babysitting. For every 3 hours you spend babysitting, you spend babysitting, you spend babysitting, you spend babysitting. 3 hours of babysitting = 2 hours shoveling snow a friend each have a collection of tokens. Initially Rate =  $10 \times \$9 = \$90$  That is, you earn \$90 in January =  $15/3 \times 2 = 10$  hours Amount earned in January =  $15/3 \times 2 = 10$  hours for every 8 tokens you had, your friend had 3. After you give half of your tokens to your friend, your friend is 8 : 3 Let I have 8 x tokens and my friend has 3 x tokens, where x is any number. Then again according to the question, After I gave half of your friend, my friend now has 18 more tokens than you. That is, (3x + 4x) - 4x = 18  $3x = 5 \times 6 = 30$  Lesson 3.4 Graphing Ratio Relationships EXPLORATION 1 Using a Coordinate Plane Work with a partner. An airplane travels 300 miles per hour. a. Represent the relationship between distance and time in a coordinate plane. Explain your question with another group. Answer their question and discuss the solution with the other group. Answer: EXPLORATION 2 Identifying Relationships in Graphs to make a ratio table. Explain how the blue, red, and green arrows correspond to the ratio table. Explain how the blue, red, and green arrows correspond to the ratio table. ratios to create ordered pairs of the form (first quantity). You can plot these ordered pairs in a coordinate plane and draw a line, starting at(0, 0), through the points. Try It Represent the ratio relationship using a graph. Question 1. Answer: Question 2. Answer: Question 3. WHAT IF? Repeat Example 2 when the cost of the dark chocolate cashews is \$15 per pound. Answer: Self-Assessment for Concepts & Skills Solve each exercise. Then rate your understanding of the success criteria in your journal. Question 5. CRITICAL THINKING Use what you know about equivalen ratios to explain why the graph of a ratio relationship passes through (0, 0). Answer: Question 6. WHICH ONE DOESN'T BELONG? Which ordered pair does not belong with the other three? Explain your reasoning. Answer: (24, 4) does not belong with the other three? Explain your reasoning. Answer: (24, 4) does not belong with the other three? Explain your reasoning. Answer: (24, 4) does not belong with the other three? skateboarding at a pace of 30 meters every 5 seconds. Your friend is in-line skating at a pace of 9 meters every 2 seconds. Graph each ratio relationship in the same coordinate plane. Who is faster? Answer: Question 8. You buy 2.5 pounds of sunflower seeds and 2.5 pounds of sunflower seeds. Use a graph to find your total cost. Then use the graph to determine how much more you pay for pumpkin seeds than for sunflower seeds. Answer: The pattern of chickens is multiple of 8. So, the missing values in the ratio table is 16. The pattern of Eggs is multiple of 6. So, the missing values in the ratio table is 18. Question 2. Answer: The missing values are 1, 12, 5 The equivalent ratios are 3 : 1, 12:4, 15:5 Write the name of the decimal number. Question 3. 7.1 Answer: We start by naming the number to the left of the decimal. We use the word "and" to indicate the decimal point. Then we name the number to the right of the decimal point as if it were a whole number. 7.1 can be written as seven and one. Question 4. 3.54 Answer: We start by naming the number to the left of the decimal point as if it were a whole number. 3.54 can be written as three and five four Question 5. 13.6 Answer: We start by naming the number to the left of the decimal point. Then we name the number to the left of the decimal point. Then we name the number to the left of the decimal point. start by naming the number to the left of the decimal point. Then we name the number. 8.132 can be written as eight and one thirty two Write two equivalent ratios that describe the relationship. Question 7. baseballs to gloves Answer: The ratio from baseballs to gloves is 8: 4 The equivalent ratios are 2: 1, 16: 8 Question 8. ladybugs to bees Answer: The ratio from ladybugs to bees is 12: 4 The equivalent ratios are 3: 1 and 24: 8 Concepts, Skills, & Problem Solving USING A COORDINATE PLANE Represent the relationship between distance and time in a coordinate plane. Exploration 1, p. 129.) Question 9. A train travels 45 miles per hour. Answer: Question 10. A motorcycle travels 800 yards per minute. Answer: Question 11. A whale travels 800 yards per minute. Answer: Question 12. A whale travels 800 yards per minute. graph. Question 13. Answer: Question 14. Answer: Question 15. Answer: Question 16. Answer: Question 17. Answer: Question 17. Answer: Question 17. Answer: Question 18. Answer: Question 19. MODELING REAL LIFE A radio station collects donations for a new broadcast tower. The cost to construct the tower is \$25.50 per inch. a. Represent the ratio relationship using a graph. b. How much does it cost to fund 4.5 inches of the construction? Answer: Question 20. MODELING REAL LIFE Your school earns \$100 for every 400 pounds of donated clothing. a. Represent the ratio relationship using a graph. b. How much money does your school earns for donating 2200 pounds of clothing? Answer: Question 21. NUMBER SENSE Just by looking at the graph, determine who earns a greater hourly wage. Explain. Answer: By seeing the above graph we can say that you earns greater hourly wage. Question 22. MODELING REAL LIFE An airplane traveling from Chicago to Los Angeles travels 15 miles every 2 minutes. On the return trip, the plane travels 25 miles every 3 minutes. Graph each ratio relationship in the same coordinate plane. Does the plane fly faster when traveling to Los Angeles or to Chicago? Answer: Question 23. MODELING REAL LIFE Your freezer produces 8 ice cubes every 5 hours. Graph each ratio relationship in the same coordinate plane. Whose freezer produces ice faster? Answer: Question 24. CHOOSE TOOLS A chemist prepares two acid solution is more acidic. c. Which method do you prefer? Explain. Answer: Question 25. DIG DEEPER! A company offers a nut mixture with 7 peanuts for every 3 almonds. The company changes the mixture to have 9 peanuts for every 5 almonds, but the number of nuts per container? b.
Graph each ratio relationship. What can you conclude? c. Almonds cost more than peanuts. Should the company change the price of the mixture? Explain your reasoning. Answer: Question 26. STRUCTURE The point (p, q) is on the graph? Answer: Lesson 3.5 Rates and Unit Rates EXPLORATION 1 Using a Diagram Work with a partner. The diagram shows a story problem. a. What information can you obtain from the diagram? b. Assuming that the car travels at a constant speed, how far does the car travels at a constant speed, how far does the car travels at a constant speed of the car. How can you use the speed of the car. How can you use the speed of the car travel in 3.25 hours? Explain your method. c. Draw a speedometer that shows the speed of the car. Ratios Work with a partner. Count the number of times you can clap your hands in 12 seconds. Have your partner record your results, write ratios that represent the numbers of claps for every 12 seconds. b. Explain how you can use the ratios in part(a) to find the numbers of times you and your partner can clap your hands in 2 minutes, and in 3 minutes. Answer: A rate is a ratio of two quantities using different units. You solved various ratio problems in the previous sections that involved rates. Now you will use unit rates to solve rate problems. Try It Question 1. WHAT IF? Repeat Example 1 when you add 4 pints of water for every 3 cups of concentrate. Answer: Self-Assessment for Concepts & Skills Solve each exercise. Then rate your understanding of the success criteria in your journal. FINDING UNIT RATES Write a unit rate for the situation. Question 3. revolutions in 50 seconds Answer: Question 4. 1400 words for every 4 pages Answer: 1400 - 4 pages X - 1 page 4 × X = 1400/4 X = 350 Thus 350 words for every 1 page. Question 5. WHICH ONE DOESN'T BELONG? Which rate does not belong with the other three? Explain your reasoning. Answer: 20 pounds per 4 feet does not belong with the other three. Explanation: 8 pounds for every 2 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet 20 pounds for every 6 feet  $\frac{24}{6} = 4$  feet  $\frac{20}{6} = 4$  feet  $\frac$ \$19.50. How much less would you spend by buying 20 pounds of birdseed at the store with the better deal? Answer: Store A for \$11.50.10 pounds - \$11.50.10 pounds =  $20 \times 1.15 = $23$  Your friend buys 15 pounds of birdseed at Store B for \$19.50.15 pounds - \$19.50.15pound - \$1.3 1.3 × 20 = \$26 \$23 < \$26 Question 7. A person hikes 4 miles in 2.5 hours. Find the unit rate in miles per hour. Then find the unit rate in hours per mile. How is each unit rate in hours per mile. How is each unit rate in hours per mile. hours So if he hike 4 miles in 2.5 hours then he will hike x mile in 1 hour x = 4/2.5 x = 1.6 miles per hour Question 8. DIG DEEPER! You buy? Answer: Rates and Unit Rates Homework & Practice 3.5 Review & Refresh Represent the ratio relationship using a graph. Question 1. Answer: Question 2. Answer: Question 3. Answer: Question 4. Answer: Question 5. \(\frac{1}{5}\) + \(\frac{2}{3}\) Explanation: Dividing two fractions is the same as multiplying the first fraction by the reciprocal of the second fraction. Take the reciprocal of the second fraction by flipping the numerator and denominator and changing the operation to multiplication. Then the equation becomes  $(\frac{1}{5}) \times (\frac{1}{5}) \times$ the reciprocal of the second fraction. Take the reciprocal of the second fraction by flipping the numerator and denominator and changing the operation to multiplication. Then the equation becomes  $(\frac{1}{6}) \times (\frac{1}{6}) \times$ same as multiplying the first fraction by the reciprocal of the second fraction. Then the equation becomes  $3(\frac{1}{6}) = \frac{1}{6} = 1 + \frac{1}{6} = 1 + \frac{1}{6} = 1 + \frac{1}{6} + \frac{1}{6} = 1 + \frac{1}{6} + \frac{1}{6} = 1 + \frac{1}{6} + \frac{1}$  $(\frac{1}{3}) = (\frac{1}{3}) = (\frac{1$ 6.613 Answer: 7.919 Question 12. The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) × 240 = 180 The winner in an election for class president received \(\frac{3}{4}\) of the 240 votes. \(\frac{3}{4}\) if the 240 votes. \(\frac{3}{4}\) i receive 180 votes. Thus the correct answer is option C Concepts, Skills, & Problem Solving USING EQUIVALENT RATIOS Use the ratio in Exploration 2, p. 135.) Question 13. 0.5 minute Answer: Question 14. 1.75 minutes Answer: Question 15. 2.25 minutes Answer: FINDING UNIT RATES Write a unit rate for the situation. Ouestion 16, 24 animals in 2 square miles Answer: 12 animals in 1 square miles 24/2 = 12 12 animals in 2 square miles 24/2 = 12 12 animals in 2 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 animals in 1 square miles 24/2 = 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 12 12 animals in 1 square miles 24/2 = 1guest. Question 18. \$28 saved in 4 weeks Answer: \$7 Explanation: Given, 18 necklaces made in 3 hours 18/3 = 6 6 necklaces 270 miles in 6 hours 270/6 = 45 45 miles in 1 classes 228/12 = 24 24 students in 1 classes Answer: 24 students in 1 classes 228/12 = 24 24 students in 12 cla kilobytes 140 kilobytes per second Question 23. 880 calories in 8 servings Answer: 110 calories in 1 serving
Explanation: Given, 1080 miles on 15 gallons Answer: 72 miles in 1 gallon Explanation: Given, 1080 miles on 15 gallons 1080/15 = 72 miles in 1 gallon Question 25. \$12.50 for 5 ounces Answer: 2.5 Explanation: Given, \$12.50 for 5 ounces 12.50/5 = 2.5 \$2.5 per ounce USING UNIT RATES Find the missing values in the ratio table. Question 26. Answer: Question 27. Answer: Question 28. MODELING REAL LIFE Lightning strikes Earth 1000 times in 10 seconds. a. How many times does lightning strike in 12 seconds? b. How many seconds does it take for lightning to strike 7250 times? Answer: Question 29. MODELING REAL LIFE You earn \$35 for washing 7 cars. 7 cars = \$35 1 car = x x × 7 = \$35 x = 35/7 = 5 Thus you earn \$5 per car 4 cars = 4 × 5 = \$20 You earn \$20 for washing 4 cars.. b. You earn \$45. How many cars did you wash? Answer: you earn \$5 per car 45/5 = 9 You wash 9 cars for \$45 COMPARING RATES Decide whether the rates are equivalent. Question 30. 24 laps in 18 minutes 72 lap Question 31. 126 points for every 3 games 210 points for every 5 games 210 points for every 3 games 210 every 36 seconds 90 breaths for every 3 minutes 15:36 = 0.4190:180 = 0.5 Thus the rates are not equivalent. Question 33. \$16 for 4 pounds \$1 for 4 ounces 4 pounds \$1 for 4 ounces 1 pounds \$1 fo LIFE An office printer prints 25 photos in 12.5 minutes. A home printer prints 15 photos in 6 minutes. Which printer is faster? How many more photos in 6 minutes using the faster printer? Answer: The home printer is faster? How many more photos in 6 minutes. minutes. 23 photos in 12.5 minutes 12.5 is half of 25 and therefore this is a two to one ratio So 2 photos in 6 minutes. Since 15 is not divisible by 6 without a remainder divide both by 3. So 5 photos in 2 minutes. This is faster than the office printer. This leaves you with an answer of 30 photos in 12 minutes. Ouestion 35. MODELING REAL LIFE You jog 2 kilometers in 16.5 minutes. Your friend jogs faster? How much sooner will the faster jogger finish a five-kilometer race? Answer: First, we have to calculate the speed of person 1 and 2. Speed = Distance/time Speed of person 1 = 2/12 = 0.167 km/min Speed of person 2 = 3/16.5 = 0.182 km/min From this we conclude that, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 jogs faster as compared to person 1 = 2/12 = 0.167 km/min Distance = 5 km S = d/t Time = 27.5 min Thus, person 2 min Thus, the time taken by the faster jogger finish a 5 kilometer race will be, 27.5 minutes. Question 36. PROBLEM SOLVING A softball team has a budget of \$200 for visors. Is there enough money in the budget to purchase 15 more sun visors? Explain your reasoning. Answer: \$112.5 Explanation: An athletic director pays \$90 for 12 sun visors for the softball team. The rate per sun visor is equal to \$90/12 = \$7.5 So the athletic director should pay \$7.5 × 15 = \$112.5 Question 37. DIG DEEPER! The table shows the amounts of food collected by two homerooms. Homeroom A collects 21 additional items of food. How many more items does Homeroom B need to collect to have more items per student? Answer: Question 38. REASONING A runner completed a 26.2-mile marathon in 210 minutes a. Estimate the unit rate, in minutes per mile. c. Another runner says, "I averaged 10-minute miles in the marathon." Is this runner talking about the unit rate described in part(a) or in part(b)? Explain your reasoning. Answer: Question 39. DIG DEEPER! You can complete one-half of a job in an hour. Your friend can complete one-half of a job in an hour. Your friend can complete one-half of a job in an hour. third of the same job in an hour 1  $\frac{1}{2} + 1 \frac{1}{3} = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  as a properties of the same job in an hour 1  $\frac{1}{2} + 1 \frac{1}{3} = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. first quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quess is about  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to be between 1/4 min to 1/6 hours. First quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has to 1/6 hours. First quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest is a bout  $\frac{1}{2}(\frac{1}{4}+1) = \frac{1}{x}$  has the first quest container. a. A full one-gallon container can be used to fill the one-liter containers, as shown below. Write a unit rate that estimates the number of gallons per liter. c. Estimate the number of gallons per liter. liters in 5.5 gallons and the number of gallons in 12 liters. What method(s) did you use? What other methods could you have used? Answer: EXPLORATION 2 Converting Units in a Rate Work with a partner. The rate that a caterpillar moves is given in inches per minute. Justify your answer. Answer: The U.S. customary system is a decimal system of measurement, based on powers of 10, that contains units for length, capacity, and mass. Key Vocabulary U.S. customary system, p. 142 metric system, p. 142 You can use unit rates and ratio tables to convert measures within the same system and between systems. Try It Question 1. Convert 48 feet to yards. Answer: 16 yards Question 2. Convert 7 miles to kilometers. Round to the nearest hundredth if necessary. Answer: Convert from miles to kilometers. 1 mile = 1.6 km 7 miles = 7 × 1.6 = 11.2 kilometers Question 3. Convert 20 quarts to liters. 1 quart = 0.94 liters 20 quarts = 20 × 0.94 = 18.92 liters Question 4. Convert 60 kilometers per hour to miles per hour. Round to the nearest hundredth if necessary. Answer: Convert from kilometer per hour = 0.621 miles p SAME QUESTION Which is different? Find "both" answers. Answer: "Find the number of inches in 5 centimeters" has different words. CONVERTING MEASURES Copy and complete the statement. Round to the nearest hundredth if necessary. Question 6. Answer: "Find the number of inches in 5 centimeters" has different words. minute 12 meter per minute = 39.37 feet per minute Question 7. Answer: 1 liter = 1.05669/1 q/2 = 1.05669/1 q/2 = 1.05669/1 q =  $2 \times 1.05669/1$  q =  $2 \times 1.056$ 2.11338 Question 9. DIG DEEPER! The speed of light is about 300,000 kilometers per second. The Sun is about 93 million miles from Earth. How many minutes does it take for sunlight to reach Earth? Answer: Question 10. A race car driver's goal is to complete a 1000-kilometer auto race in 4 hours or less. The driver's average speed is 4200 meters

per minute. Does the driver meet the goal? If not, how much faster (in meters per minute) must the driver be to meet the goal? Answer: 51 per minute Explanation: 102 beats per 2 minutes 102/2 = 51 beats per minute Question 2. 60 shirts for every 5 clothing racks Answer: 12 for 1 clothing racks Explanation: 60 shirts for every 5 volunteers Answer: 20 for 1 volunteer Explanation: \$100 donated for every 5 volunteers 100/5 = 20 \$20 donated for 1 volunteer Question 4. 30 milliliters every 4 hours Answer: 7.5 ml per hour Explanation: 30 milliliters every 4 hours 30/4 = 7.5 So, 7.5 ml per hour Answer: C Explanation: Find and list multiples of each number until the first common multiple is found. This is the lowest common multiple. number 56 is 2 x 2 x 2 x 7 Question 7. 74 Answer:  $3 \times 3 \times 7$  Explanation:  $63 = 3 \times 21 = 3 \times 3 \times 7$  Thus the prime factorization of the number 63 is  $3 \times 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Thus the prime factorization of the number 63 is  $3 \times 3 \times 7$  Question 7. 74 Answer:  $2 \times 37$  Thus the prime factorization of the number 63 is  $3 \times 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 33 = 3 \times 7$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 2 \times 37$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 66 = 2 \times 27$  Explanation:  $132 = 2 \times 27$  Explanation:  $132 = 2 \times 37$  Explanation:  $132 = 2 \times$ Problem Solving COMPARING MEASURES Answer the question. Explain your answer. (See Explorations 1 & 2, p. 141.) Question 13. Which juice container is larger: 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.26 gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 1 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 2 liter = 0.52 gal 1 gal = 3.78 liter Thus the juice container with 1 gal is larger? 2 L or 1 gal? Answer: Convert from liters to gal 2 liter = 0.52 gal 2 liter cm? Answer: 1 inch is longer than 2 cm Explanation: Convert from inches to cm 1 inch = 2.54 cm 2.54 cm > 2 cm CONVERTING MEASURES Copy and complete the statement. Question 15. Answer: 1 inch = 2 cups 3 pints = 3 × 2 cups = 6 cups Question 16. Answer: 1.5 L Explanation: Convert from mL to L 1000 mL = 1 L 1500 mL = 1.5 L Question 17. Answer: 2.5 lb Explanation: Convert from get to inches 5 feet =  $5 \times 12 = 60$  $4 \text{ qt} 6 \text{ gal} = 6 \times 4 \text{ qt} = 24 \text{ qt} \text{ So}, 6 \text{ gal} = 24 \text{ qt} \text{ So}, 6 \text{ gal} = 24 \text{ qt} \text{ Question 20}.$  Answer: 5 m Explanation: Convert from cm to m  $1 \text{ cm} = 480 \text{ mm} \text{ So}, 48
\text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text{ cm} = 480 \text{ mm} \text{ So}, 48 \text$ Explanation: Convert from grams to kilograms 1 kg = 1000 g 6000g = 6 kg Question 23. Answer: Explanation: Convert from fl ounce to cups 1 fl oz = 0.125 cups 32 fl ouz = 4 cups CONVERTING MEASURES Copy and complete the statement. Round to the nearest hundredth if necessary. Question 24. Answer: 13 qt Explanation: Convert from liters to quarts. 1 L = 1.05 qt 12 L = 12.608 qt 12 L  $\approx$  13 qt Question 25. Answer: 1 m Explanation: Convert from feet to meter 1 feet = 0.3 m 4 feet = 1.21 m 4 ft  $\approx$  1 m Question 27. Answer: 29 kg Explanation: Convert from lb to kgs. 1 lb = 0.45 kg 64 lb = 29.02 kg 64 lb  $\approx$  29 kg Question 28. Answer: 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 1 km = 0.621 miles 0.3 km = 0.186 mi Explanation: Convert from kg to miles 0.4 km = 0.621 miles 0.4 km Explanation: Convert from kg to lb 1 kg = 2.20 lb 17 kg = 37.47 lb 17 kg  $\approx$  34 lb Question 31. Answer: 6 inches Explanation: Convert from miles to kilometers 1 mile = 1.609 km 9 miles = 14.48 km 9 miles  $\approx$  14 km Question 33. Answer: 14 km Explanation: Convert from miles to kilometers 1 mile = 1.609 km 9 miles = 14.48 km 9 miles  $\approx$  14 km Question 33. Answer: 14 km Explanation: Convert from miles to kilometers 1 mile = 1.609 km 9 miles = 14.48 GRAPHING RELATIONSHIPS Represent the relationship between each pair of units in a coordinate plane. a. feet and yards b. pounds and kilograms Answer: Question 34. MODELING REAL LIFE Earth travels 30 kilometers each second as it revolves around the Sun. How many miles does Earth travel in 1 second? Answer: Question 35. MODELING REAL LIFE The Mackinac Bridge in Michigan is the third-longest suspension bridge in the United States. a. How high above the water is the length in kilometers? Answer: USING CONVERSION FACTORS Copy and complete the statement. Round to the nearest hundredth if necessary. Question 36. Answer: 90 gal Explanation: Convert from cubic feet to the gallon 1 cu ft = 7.48 gal 12 cu ft  $\approx$  90 gal Question 37. Answer: 6 L Explanation: Convert from liters to gal 1 L = 0.264 gal 5  $L = 5 \times 0.264$  gal = 1.32 gal 5 L  $\approx$  1 gal Question 39. Answer: 8 miles per hour 1 km per hour 1 km per hour 1 km per hour 1 km per hour 200 liter per hour 1 km per hour 1 km per hour 1 liter per minute = 60 liter per hour 22 liter per minute = 1320 liter per hour guestion 41. Answer: 0.175 miles per second 63 miles per hour = 0.0002 miles per second 63 miles per hour = 0.175 miles per second 63 miles per hour = 0.175 miles per second 63 miles per hour = 0.175 miles per hour = 0.175 miles per second 63 miles per hour = 0.175 miles pe your reasoning. Answer: Convert from liters to quarts 1 liter = 1.05 gt 8 liter = 8.45 gt (approx) Yes, your friend is correct. Question 43. MODELING REAL LIFE The diagram shows the number of guarts of blood the human heart pumps per minute. a. How many guarts of blood does the human heart pump per hour? Answer: 1 hour = 60 minutes The heart pumps 5 guarts of blood per minute 1 min = 5 guarts 60 min = 60 × 5 guarts = 300 guarts Thus the heart pumps 300 guarts of blood per minute? Answer: Given, The heart pumps 5 guarts of blood per minute 1 min = 5 guarts to liters 1 guart = 0.94 L 5 guarts = 4.73 L Thus it pumps 4.73 L of blood per minute. Question 44. PROBLEM SOLVING After washing dishes, water drips from the faucet. The graph shows the number of cups of water that drip from the faucet in 24 hours? Answer: COMPARING MEASURES Copy and complete the statement using < or >. Question 45. Answer: < Explanation: Convert from ounce to kg 1 oz = 0.02kg 30 oz = 0.85kg Thus 30 oz < 8 kg Question 46. Answer: < Explanation: Convert from feet to centimeter 1 feet = 30.48 cm 6 feet = 182.88 Thus 6 feet < 300 cm Question 47. Answer: > Explanation: Convert from gal to liter 1 gal = 3.78L 3 gal = 11.35L Thus 3 gal > 6L Ouestion 48. Answer: > Explanation: Convert from inches to mm. 1 in = 25.4 mm Thus 254 mm Thus 4921.26 ft 4921.26 ft > 3000 ft USING DERIVED UNITS Copy and complete the statement. Round to the nearest hundredth if necessary. Question 51. Answer: 112 miles per hour 3 km per min = 37.28 miles per hour 3 km per min = 37.28 miles per hour 3 km per min = 111.84 miles per hour 3 km per min = 37.28 miles per hour 3 km per min = 37.28 miles per hour 3 km per min = 37.28 miles per hour 3 km per min = 111.84 miles per hour 3 km per min = 37.28 miles per hour 3 112 miles per hour Question 52. Answer: 1.13 qt per minute 17 gal per hour = 0.06 qt per minute 17 gal per hour = 0.006 inches per second 600 cm per minute = 3.93 inches per second 600 cm per minute ≈ 4 inches per second Question 54. MODELING REAL LIFE You are riding on a zip line. Your speed is 15 miles per hour. Convert from mile per hour to feet per second 1 mile per hour = 1.46 feet per second 15 miles per hour = 22 feet per second Question 55. PROBLEM SOLVING Thunder is the sound is about 1225 kilometers per hour. About how many miles away was the lightning? Answer: Question 56. PROBLEM SOLVING Boston, Massachusetts, and Buffalo, New York, are hit by snowstorms that last 3 days. Boston accumulates snow at a rate of 0.01 inch every minute. Which city accumulates snow at a rate of 1.5 feet every 36 hours. Buffalo accumulates snow at a rate of 0.01 inch every minute. DEEPER! You travel 4000 feet every minute on a snowmobiles in your state is 55 miles per hour. Is your speed limit? Justify your answer. b. What is your pace in minutes per mile? c. You are 22 miles from your house at 6:00 P.M. If you continue to travel at this speed, do you reach your house in time for dinner at 6:30 P.M.? Answer: Question 58. REASONING The table shows the flying speed of any of the birds? b. The peregrine falcon has a dive speed of 322 kilometers per hour. Is the dive speed of the peregrine falcon faster than the flying speed of any of the birds? Explain. Answer: Question 59. STRUCTURE Consider the conversion facts 1 inch = 2.54 centimeters and 1 metric units and U.S. customary units using the conversion facts in the back of the book. Answer: Question 60. DIG DEEPER! One liter of paint covers 100 square feet. First, convert 800 square meters to square feet. I calculated it to be 8611.13 sq ft 100 sq.ft/1 L x L = 8611.13. Now convert L to gallons. 1gallon = 3.785 L Ratios and Rates Connecting Concepts Using the Problem-Solving Plan Question 1. You mix water, glue, and borax in the ratio of 3 : 1 : 2 to make slime. How many gallons of each ingredient should you use to make 0.75 gallon of slime? Understand the problem. You know the ratio of the ingredients in the slime and that you are making 0.75 gallon of slime. Make a plan. Represent the ratio 3 : 1 : 2 using a tape diagram. Because there are 6 parts that represent 0.75 gallon, divide 0.75 by6 to find the value of one part of the tape diagram. Then use the value of one part to find the number of gallons of each ingredient you should use. Solve and frozen fruit bars for a party. Yogurt cups are sold in packages of six. The ratio of the number of yogurt cups in a package to the numbers of prozen fruit bars in a package is 3 : 2. What are the
least numbers of packages you should buy in order to have the same numbers of two whole numbers is 9. The ratio of the greater number to the lesser number is 6:5. What are the two numbers? Justify your answer. Answer: Performance Task Oops! Unit Conversion Mistakes At the beginning of this chapter, you watched a STEAM Video called "Human Circulatory System." You are now ready to complete the performance task related to this video, available at BigIdeasMath.com. Be sure to use the problem-solving plan as you work through the performance task. Ratios and Rates Chapter Review a Definition and Example Chart for the vocabulary term ratio. Choose and complete a graphic organizer to help you study the concept. 1. value of a ratio 2. equivalent ratios 3. tape diagram 4. ratio table 5. rate 6. unit rate 7. conversion factor Chapter Self-Assessment As you complete the exercises, use the scale below to rate your understanding of the success criteria in your journal. 3.1 Ratios (pp. 107-114) Learning Target: Understand the concepts of ratios and equivalent ratios. Write the ratio is 3 : 2 Question 2. saxophones : trumpets Answer: 6 : 3 Explanation: There are 6 saxophones and 3 trumpets Thus the ratio is 6: 3 and the equivalent ratio is 1: 2 Question 3. The ratio of hydrogen atoms to nitrogen atoms to nitrogen atoms is 3 times the number of hydrogen atoms to nitrogen atoms is 3 times the number of hydrogen atoms to nitrogen atoms to nitro atoms. Answer: Determine whether the ratios are equivalent. Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are not equivalent Question 6. 6 : 4 and 18 : 6 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratios are equivalent Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 and 8 : 7 Answer: No Explanation:  $4/3 \neq 8/7$  Thus the ratio Question 5. 4 : 3 a =  $3 3/2 \neq 3$  Thus the ratios are not equivalent Question 7. 18 : 12 and 3 : 2 18/12 = 3/2 3 : 2 = 3 : 2 Thus the ratios that have values of \(\frac{5}{7}\) Answer: \(\frac{10}{14}\) and \(\frac{15}{21}\) Question 9. During a chess match, there are 12 pieces left on the board. The ratio of white pieces to black pieces is 2 : 1. How many white pieces are on the board? Answer: 3.2 Using Tape Diagram (pp. 115-120) Learning Target: Use tape diagrams to model and solve ratio problems. The tape diagram represents the ratio of the time your friend spends reading. You read for 8 hours. How many hours does your friend spend reading? Question 11. Answer: Question 12. Answer: Question 13. The tape diagram represents the ratio of the time your friend spends reading. the ratio of customers to quides on a mountain climbing trip. There are 6 quides on the trip? Answer: A container has peppermint qum in the container and the ratio of peppermint qum. Find the number of pieces of spearmint gum in the container. Question 14. 24 peppermint; 8 to 5 Answer: Let the total number of peppermint gum in the container = x The ratio is  $8:58+5=138/13 \times x=24 \times 13/8 \times x=24 \times x=24$ container = x The ratio is  $2:32 + 3 = 52/5 \times x = 18 \times 5/2 \times x = 18 \times 5/2 \times x = 18 \times 5/2 \times x = 45$  Number of spearmint gum and spearmint gum = 27 Question 16. 32 peppermint; 8 to 7 Answer: Let the total number of spearmint gum and spearmint gum and spearmint gum = 27 Question 16. 32 peppermint; 8 to 7 Answer: Let the total number of spearmint gum and spearmint gum = 27 Question 16. 32 peppermint; 8 to 7 Answer: Let the total number of spearmint gum and spea in the container = x The ratio is 8 : 7 8 + 7 = 15 8/15 × x = 32 × 15/8 x = 4 × 15 x = 60 Number of spearmint gum in the container = x The ratio × total number of spearmint/total ratio × total number of spearmint gum in the container = x The ratio × total number of spearmint gum in x The ratio is 5: 25 + 2 = 75/7 × x = 40 x = 40 × 7/5 x = 8 × 7 x = 56 Number of spearmint gum will be now Ratio of spearmint/total ratio × total number of spearmint/total ratio × total number of spearmint gum will be now Ratio of spearmint tickets and student tickets. You are given the total number of spearmint gum will be now Ratio of spearmint gum will be now R sold. How many of each type of tickets are sold? Question 18. 120 tickets; 6 to 4 Answer: The ratio of adult tickets sold is  $6:46+4=106/10=x/1206 \times 120=x \times 1010x=720$  x = 720/10 = 72 x = 72 The number of student tickets would be 120 - 72 = 48 student tickets; 8 to 7 Answer: The ratio of adult tickets are sold? adult tickets sold to student tickets sold is  $8:78+7=158/15=x/1658\times165=x\times151320=15x$  x = 1320/15 x = 88 The number of student tickets would be 165 - 88 = 77 student tickets sold is  $16:516+5=2116/21=x/21016\times210=x\times213360=15x$ 21x = 3360/21 x = 160 The number of student tickets sold to student tickets would be 210 - 160 = 50 student tickets sold to student tickets and to student tickets would be 248 - 155 = 93 student tickets would be 248 - 155 = 93 student tickets would be 248 - 155 = 93 student tickets would be 248 - 155 = 93 student tickets would be 210 - 160 = 50 student tickets would be 248 - 155 = 93 student tickets would be 248 - 155 = 93 student tickets would be 248 - 155 = 93 student tickets would be 210 - 160 = 50
student tickets would be 210 - 160 = 50 student tickets would be 210 - 160 = 50 student tickets would be 210 - 160 = 50 student tickets would be 210 - 160 = 50 student tickets would be 210 - 160 = 50 student tickets would be 210 - 160 = 50 stud You perform 7 sit-ups for every 2 pull-ups as part of an exercise routine. You perform 25 more sit-ups than pull-ups. How many sit-ups and 10 pullups. How many sit-ups and how many pull-ups as part of an exercise routine. You perform 25 more sit-ups than pull-ups. so we know that for 7 situps you do 2 pullups so the possible values would be 7,2 14,4 21, 6 28, 8 35, 10, and so on so now you just look at which two numbers have a difference of 25. 3.3 Using Ratio Tables (pp. 121-128) Learning Target: Use ratio tables to represent equivalent ratios and solve ratio problems. Find the missing values in the ratio table. Then write the equivalent ratios. Question 23. Answer: Question 24. Answer: Question 25. Answer: Question 26. Answer: Question 27. Answer: Question 27. Answer: Question 28. Answer table. Justify your answer. Answer: Question 30. A song has 12 beats every 5 seconds. For many beats are there in 30 seconds = 12/5 = 2.4 beats 30 seconds =  $30 \times 2.4$  beats Thus 72 beats are there in 30 seconds. For many beats are there in 30 Question 31. On New Year'sEve, the Times Square ball is lowered 47 feet every 20 seconds. How long does it take for the ball to be lowered 47 feet every 20 seconds. All you have to do is cross multiply and isolate x. 47/20 × 141/x 47x = 2820 x = 60 seconds Question 32. Welder A charges \$300 for every 4 hours of labor. Welder B would charge \$75 while welder A would charge \$75 while welder A hours of labor. Which welder B would charge \$75 while welder A hours of labor. Which welder B would charge \$75 while welder A hours of labor. Welder B would charge \$10 for every 3 hours of labor. Welder B would charge \$75 while welder A hours of labor. Welder B would charge \$75 while welder A hours of labor. Welder B would charge \$75 while welder A hours of labor. Which welder B would charge \$75 while welder A hours of labor. Welder B would charge \$75 while welder A hours of labor. Welder B would charge \$75 while welder A hours of labor. Welder B would charge \$10 make a ho lemonade by adding 11 cups of water for every 3 cups of lemon juice. Your friend makes lemonade is more watered down? Answer: Well first I did was I found out that both 3 and 2 go into 12.2 goes into 12 6 times. 9 × 6 is 54.3 goes into 12 four times. 11 × 4 is 44.54 is greater than 44 therefore the answer would be your friend. 3.4 Graphing Ratio Relationships (pp. 129-134) Learning Target: Represent the ratio relationships in a coordinate plane. Represent ratio relationships in a coordinate plane. Represent ratio relationships in a coordinate plane. ratio relationship using a graph. b. How much does 3.5 pounds of magnesium sulfate cost? Answer: Question 37. A 5-ounce can of tuna costs \$2.40. Graph each ratio relationship in the same coordinate plane. Which is the better buy? Answer: 3.5 Rates and Unit Rates (pp. 135-140) Learning Target: Understand the concept of a unit rate and solve rate problems. Write a unit rate for the situation. Question 38. 12 stunts in 4 movies Answer: 3 Explanation: 3600 stitches in 3 minutes 3600/3 = 1200 1200 stiches in 1 minute Question 40. \$18 for 6 pounds Answer: 3 Explanation: \$18 for 6 pounds 18/6 = 3 \$3 for 1 pound Question 42. A train travels 120 miles in 3 hours. Write two unit rates that describe the relationship between the number of miles and the number of hours the train travels. Answer: Question 43. Mercury orbit the Sun 3 times in 264 days. a. How many times does Mercury orbit the Sun in 440 days? b. How many days does it take Mercury to orbit the Sun 3 times? Answer: Given, A cyclist travels 4 miles in 20 minutes 30/5 = 6 minutes 30 1:: 3: 1 The rates are not equivalent Question 46. 210 miles in 3 hours 780 miles in 3 hours 780 miles in 12 hours Answer: No Explanation: 210 miles in 3 hours 780 miles in 3 ho trash in 48 minutes. Who fills bags with trash faster? How much sooner will the faster person fill 7 bags × 14 min = 98 min 105 - 98 = 7 minutes.  $48 \div 3 = 167$  bags × 16 min = 105 min 7 bags × 14 min = 98 min 105 - 98 = 7 minutes 3.6 Converting Measures (pp. 141-148) Learning Target: Use ratio reasoning to convert units of measure. Copy and complete the statement. Round to the nearest hundredth if necessary. Question 49. Answer: 4 yd Explanation: Convert from feet to yards 1 feet = 0.33 yard 12 feet = 4 yards Question 50. Answer: 3.5 Explanation: Convert from inches to quarts 1 L = 1.05 qt 3 L = 3.17 qt Thus  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 52. Answer: 23 cm Explanation: Convert from inches to quarts 1 L = 1.05 qt  $3 L \approx 3$  qt Question 53. Answer: 23 centimeters 1 in = 2.54 cm 9.2 in = 23.36 cm 9.2 in = 23.36 cm 9.2 in = 23.36 cm 9.2 in = 23.26 cm 9.2 in = 23.36 cm 9.2 in = 23.36 cm 9.2 in = 23.26 cm 9.2 in = 23.36 cm 9. from gal to gt 1 gal = 4 gt 13 gal = 52 gt Question 56. Answer: Question 56. Answer: Question 57. Explain how to use conversion factors to find the number of fluid ounces in any given number of fluid ounces in any given number of fluid ounces in any given number of a liquid. Answer: Given, Water flows through a pipe at a rate of 10 gallons per minute. 1 hour = 60 minute 1 minute = 10 gallon 60 minutes = 60 × 10 gallon s of water flow through the pipe in an hour. Question 59. Germany suggests a speed limit of 130 kilometers per hour on highways. Is the speed shown greater than the suggested limit? Answer: Question 60. The distance between two stars increases at a rate of 3 centimeters per month. What is the rate in inches per year? Answer: 14.17 inches Explanation: Given, The distance between two stars increases at a rate of 3 centimeters per month. centimeters to inches 36 centimeters = 14.17 inches Ratios and Rates Practice Test Question 1. Write the ratio of scooters to bikes is 3: 3 Question 2. Determine whether the ratios 8: 7 and 15: 14 are not equivalent. The equivalent ratio of 8:7 is 16: 14. Find the missing values are 12, 18 The ratio is 2: 1 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values
are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The ratio is 2: 9 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 12: 54 and 10: 45 Question 4. Answer: The missing values are 54, 10 The equivalent ratio of 2: 9 is 5. Represent the ratio relationship using a graph. Answer: 56 Explanation: Given, You travel 224 miles in 4 hours. Find the unit rate is 56 miles. Copy and complete the statement. Round to the nearest hundredth if necessary. Question 7. Answer: Explanation: Convert from hours to gal 1 liter = 0.39 6 cm =  $6 \times 0.39$  6 cm = 2.34 inches Question 9. Answer: Explanation: Convert from hours to week 1 hour = 0.005 = 5/1000 10 gal/h = 2000/wk Question 10. Answer: Explanation: Convert from feet to meters 1 feet = 0.30m 4 feet = 1.21 m 4 ft ≈ 1m Question 11. During a baseball season, Team A scores 9 runs for every 7 runs that Team B scores. The total number of runs scored by both teams is 1440. How many runs does each team score? Answer: Team A scores 810 Team B scores 630 Explanation: During a baseball season, Team A scores 9 runs for every 7 runs that Team B scores. The total number of runs scored by both teams is 1440. Let b scores x runs. Total number of runs scored by both teams is 1440 a + b = 1440 x + (2 × x/7) + x = 1440 (16 × x)/7 = 1440 16 × x = 1440 × 7 16x = 10080 x = 10080/16 x = 630 Thus team b scores 630 runs Team a scores is x + (2 × x/7) = 810 runs Question 12. At a movie theater, the ratio of filled seats to empty seats is 6 : 5. There are 120 empty seats are filled? Answer: 144 Explanation: Given, At a movie theater, the ratio of filled seats to empty seats is 6 : 5. There are 120 empty seats. Number of filled = 6 Number of empty = 5 120/5 = 24 then multiply it by 6 to get 144. Thus the number of filled seats = 144 Question 13. You add 3 cups of citric acid for every 16 cups of water. Whose mixture is more acidic? Answer: A's mixture is more acidic Explanation: Given, You and your friend mix water and citric acid for every 16 cups of citric acid for every 16 cups of citric acid for every 16 cups of citric acid for every 12 cups of water = 3/16 B adds 2 cups of citric acid for every 12 cups o 2/12 LCM of 16 and 12 are 48 16 - 16, 32, 48, 64, 80, 96 12 - 12, 24, 36, 48, 60, 72 A -  $3/16 \times 3/3 = 9/48$  B -  $2/12 \times 4/4 = 8/48$  We found that in terms of 48 cups of acid, means A is adding more acid, means A is adding more acid than B and hence friend A's mixture is more acidic. Question 14. Determine which windsurfer is faster. Explain your reasoning. Answer: The second windsurfer is faster than the first windsurfer. First convert from meter to feet 1 meter = 3.285 meter =  $16.40 \times 60 = 984$  feet is greater than 720 feet 0.40 × 60 = 984 feet is greater than 720 feet 0.40 × 60 = 984 feet is greater than 720 feet 0.40 × 60 = 984 feet is greater than 720 feet 0.40 × 60 = 984 feet is greater than 720 feet 0.40 × 60 = 984 feet is greater than 720 feet 0.40 × 60 = 984 fe The length of the rectangle is 13.875 feet greater than the width. What are the perimeter and the area of the rectangle? Answer: P = 64.75 feet A = 213.91 feet A = 213.feet So, the length of the rectangle is 23.125 feet  $4.625 \times 2 = 9.25$  feet So, the width of the rectangle is 9.25 feet We know that, Perimeter of the rectangle =  $1 \times w$  A =  $23.125 \times 9.25$  Area = 213.91 sq. feet Ratios and Rates Cumulative Practice Question 1. Which number is equivalent to \(\frac{2}{9}\) ÷ \(\frac{2}{13}\) B. \(\frac{5}{13}\) D. 3\(\frac{5}{13}\) D. 3\(\frac{5}{13}\) D. 3\(\frac{5}{13}\) D. 3\(\frac{5}{13}\) Answer: \(\frac{5}{13}\) Answer: \(\frac{5} and denominator and changing the operation to multiplication. Then the equation becomes  $(\frac{10}{36}) + (\frac{10}{36}) + (\frac{10}{36}$ correct answer is option B. Question 2. Your speed while waterskiing is 22 miles per hour. How fast are you traveling in kilometers 22 miles per hour? Round your answer to the nearest hundredth. Answer: 35 kilometers per hour? Round your answer to the nearest hundredth.  $22 \times 1.609 = 35.40$  kilometers Question 3. Which number is equivalent to the expression below?  $2.42 + 3(6 \div 2)$  F. 25 G. 41 H. 73 I. 105 Answer:  $2.42 + 3(6 \div 2)$  F. 25 H. uses 12 red beads. How many green beads are in the bracelet? A. 4 green beads C. 12 green beads D. 20 green beads to green beads to green beads to green beads to green beads are in the bracelet. The bracelet uses 12 red beads. From the above figure we observe that there are 3 3 × 4 = 12 1 box = 4 beads There are 2 green boxes 2 × 4 = 8 Thus there 8 green beads in the bracelet. Question 5. What is the least common multiple of 8, 12, and 20? F. 24 G. 40 H. 60 I. 120 Answer: 120 Explanation: Find and list multiples of 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136 Multiples of 12: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144 Multiples of 20: 20, 40, 60, 80, 100, 120, 140, 160 Therefore, LCM(8, 12, 20) = 120 Thus the correct answer is option I. Question 6. Which number is equivalent to 2.34 × 1.08 × 5.6? A. 12.787632 B. 14.15232 C. 23.5872 D. 14,152.32 Answer: 14.15232 Explanation: Multiply the three numbers 2.34 × 1.08 × 5.6 we get 14.15232 Thus the correct answer is option B. Question 7. The school store sells 4 pencils for \$0.50. Cost of 1 pencil is  $0.50/4 = 0.125 \ 0.125 \times 10 = 1.25$  Thus the
cost of 10 pencils is \$1.25 Question 8. A factor tree for 14,700 is shown. Which factor of 14,700 is shown. Which fact  $5 \times 7 \times 7$  We see that each of 2, 5 and 7 appears twice in the factorization. But 3 appears only once, for which the number 14700 is not a perfect square number is = 14700 ÷ 3 = 4900 = 70<sup>2</sup> 588 is not a perfect square Thus the correct answer is option I. Question 9. Which of the following is a ratio of frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the ratio from frogs to snakes? A. 4 : 8 B. 8 : 12 C. 8 : 4 D. 4 : 12 Answer: 8:4 Explanation: By seeing the above figure we can write the above fi Multiply 9 and 2 and Evaluate 18<sup>3</sup> Thus the correct answer is option A. Ouestion 12. The ratio of scrambled eggs served at a restaurant is 6 : 2. Part A Make a ratio table showing three possible combinations of Part B Represent the ratio relationship using a graph. Part C Use the graph to find the number of hard-boiled eggs served at a restaurant is 6 : 2. Part A Make a ratio table showing three possible combinations of Part B Represent the ratio relationship using a graph. when the restaurant serves 15 scrambled eggs. Answer: Part A - The three possible combinations are 3: 1 12: 4 18: 6 Part B - Part C- The ratio is 3:1 The ratio for 15 scrambled eggs 15: 5 Conclusion: You can Download Middle School Big Ideas Math Answers Grade 6 Chapter 3 Ratios and Rates through the direct links provided here. Make use of the links and practice well for the exams. Keep in touch with our site to get the latest updates regarding the BIM 6th Grade Answer Key Chapter wise.

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