WALCH EDUCATION

Daily Warm-Ups PRE-ALGEBRA

Common Core State Standards

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Part 4: Ratios and Proportional Relationships

Overview

Grade 6

- Understand ratio concepts and use ratio reasoning to solve problems.

Grade 7

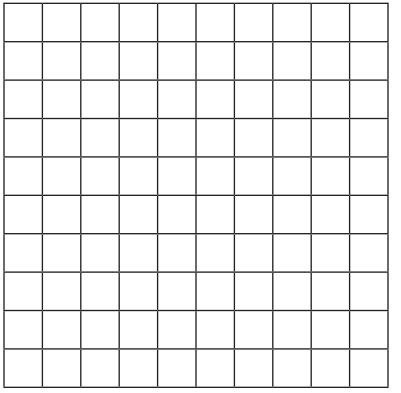
- Analyze proportional relationships and use them to solve real-world and mathematical problems.

Birthday Roses

Alonzo is planning to purchase roses for his mother on her birthday. He has seen them advertised at 12 roses for $15.00 and 20 roses for $23.00. Which is the better buy?

Square Pizza

Lin, Lon, Lu, and Lau have ordered a pizza from the Tip Top Pizza Palace. The pizzas only come in one size and are in the shape of a square. Lau has just had a blueberry smoothie and is not very hungry, but she thinks that she might eat 10% of the pizza. Lon is famished and thinks that he might eat half of the pizza. Lin thinks she might eat about 35% of the pizza, and Lu thinks he might eat 15%. If the four friends eat the portions that they have predicted, what percent of the pizza will remain? Justify your thinking using a 10 × 10 grid like the one below.



Paolo's Pizza Pricing

Paolo has just started working at his Uncle Antonio's pizza parlor. He is trying to figure out which size meat lover's pizza provides the best value.

Meat Lover's Special

9-inch round pizza…….$10.50
12-inch round pizza…….$15.00
18-inch round pizza……..$19.00

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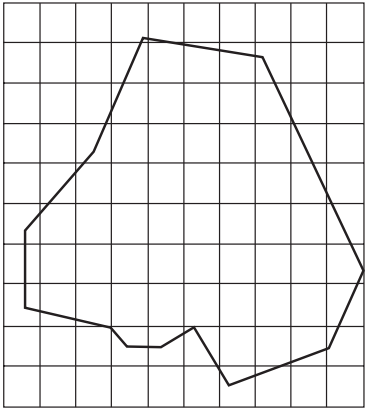
Which pizza listed on the menu provides the best value? Write a few sentences that explain your reasoning.

Balancing a Milk Bottle

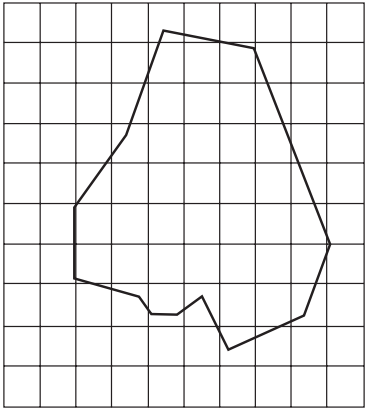
An American named Ashrita Furman holds more Guinness World Records than any other person. In April 1998, he walked 81 miles in 23 hours, 35 minutes while balancing a milk bottle on his head. How fast did he walk in miles per hour?

Vanishing Wetlands

Bonita works for the Desoto Park Service. The Little Otter Wetland Area that she monitors has had drought conditions recently. She is preparing a report on the drought for the park service. The grid below represents a model for the change in area of the wetland. What was the percent change in wetland area from August 2010 to August 2011? Explain your thinking.



August 2010 model



August 2011 model

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Percent Increase or Decrease

Look at the sequences below. For each, tell whether there is growth or decay, identify the common ratio, and give the percent increase or decrease.

1. 43, 129, 387, 1,161, . . .

2. 90, 99, 108.9, 119.79, . . .

3. 1,800, 1,080, 648, 388.8, . . .

4. 17.8, 3.56, 0.712, 0.1424, . . .

5. 375, 142.5, 54.15, 20.577, . . .

6. 1. $\frac{7}{10}$, $\frac{13}{20}$. In addition to equivalent-fraction procedures, students could use fraction strips or fraction circles to show the relationships between the fractions.
   2. Students might use fraction strips or circles to show that $\frac{11}{12}$ leaves the smallest remainder in the whole unit, and therefore is the larger fraction.
7. Max is right. Possible thinking: Both $\frac{3}{4}$ and $\frac{2}{3}$ are greater than $\frac{1}{2}$, so the result should be greater than 1, but $\frac{5}{7}$ is less than 1. Students also might discuss the common denominator equaling 12.
8. Students should give examples of multiplying and dividing with fractions to show that sometimes multiplication results in smaller products and division results in larger quotients than the number originally being multiplied or divided.

Part 3: Measurement and Data

9. 1. 15 × 21 = 315/9 = 35 square yards × $7.32 = $256.20
   2. (15 + 21)2 = 72 feet; 72/8 = 9 pieces of molding × $134.00 = $1,206
10. There are five unique rectangles: 1 × 48, 2 × 24, 3 × 16, 4 × 12, 6 × 8. The smallest perimeter is 28 units for the 6 × 8 rectangle. The largest perimeter is 98 units for the 1 × 48 rectangle. None are perfect squares.
11. Yes, there's room for 5 pairs. They require 15 to 20 square feet. 12 pairs would require 36 to 48 square feet. To provide the maximum space, Kanya and her father could increase the depth by 4 feet or the width by 6 feet.

Part 4: Ratios and Proportional Relationships

12. Students could scale to 60 roses, which yields $75 and $69 respectively, or find the price per rose, which yields $1.25 and $1.15 respectively. Thus, 20 roses for $23.00 is the better buy per rose.
13. There will be no remainder. The friends predict that they will eat 110% of the pizza (10% + 50% + 35% + 15% = 110%), so there won't be enough.
14. The 18-inch pizza provides the best value. 9-inch pizza: 63.6 square inches/10.5 = 6.06 square inches per $1.00; 12-inch pizza: 113.1 square inches/15 = 7.54 square inches per $1.00; 18-inch pizza: 254.5 square inches/19 = 13.39 square inches per $1.00

Standards Correlations

Daily Warm-Ups: Pre-Algebra, Common Core State Standards is correlated to the following Common Core State Standards Initiative domains for grades 4–8 mathematics: Operations and Algebraic Thinking; Number and Operations—Fractions; Measurement and Data; Ratios and Proportional Relationships; The Number System; Expressions and Equations; Functions; Geometry; and Statistics and Probability. The exercises appear in the order in which the corresponding standards are posted at www.corestandards.org/the-standards/mathematics. The numbers of the standards and the standards themselves are included in the table that follows.

Problem Number	Common Core State Standard(s)
Category: Operations and Algebraic Thinking	
1	**4.OA.3.** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
2	**4.OA.4.** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
3	**4.OA.4.** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.