

Name: _____
Date: Key
Period: _____

Algebra 1 Chapter 2 Part B Study Guide

Determine whether each pair of ratios are equivalent ratios. Write yes or no and justify your answer

1. $\frac{7}{9}, \frac{42}{54}$

$7 \div 9 = 0.\overline{7}$
 $42 \div 54 = 0.\overline{7}$ yes

2. $\frac{6}{10}, \frac{2}{5}$

$6 \cdot 5 = 30$
 $2 \cdot 10 = 20$
 $30 \neq 20$ No

Solve each equation

3. $\frac{5x}{4} = \frac{x}{12}$

$4x = 5 \cdot 12$
 $\frac{4x}{4} = \frac{60}{4}$ x = 15

4. $\frac{(x+10)}{10} = \frac{18}{12}$

$12(x+10) = 10 \cdot 18$
 $12x + 120 = 180$
 $\frac{12x}{12} = \frac{60}{12}$ x = 5

5. On a model airplane the scale is 5 centimeters = 2 meters. If the model's wingspan is 28.5 centimeters, what is the actual wingspan?

$$\frac{5}{2} \propto \frac{28.5}{x}$$

$$5x = 2 \cdot 28.5$$

$$\frac{5x}{5} = \frac{57}{5}$$

$$x = 11.4 \text{ meters}$$

The actual wingspan is about 11.4 meters

6. The B-Clean Car Wash washed 128 cars in 3 hours. At that rate, how many cars can they wash in 8 hours?

$$\frac{128}{3} \propto \frac{x}{8}$$

$$3x = 8 \cdot 128$$

$$\frac{3x}{3} = \frac{1024}{3} \quad x = 341.\bar{3}$$

$$x = 341 \text{ cars}$$

They can wash 341 cars in 8 hours

Find each value/percent.

7. What is 23% of 46?

$$23\% \Rightarrow 0.23 \cdot 46$$

$$= 10.58$$

8. 75 is what percent of 225?

$$\frac{75}{225} = \frac{x}{100}$$

$$\frac{75}{225} \propto \frac{x}{100}$$

$$\frac{225x}{225} = \frac{7500}{225}$$

$$x = 33.\bar{3}\%$$

9. 37.5 is 60% of what number?

$$\frac{37.5}{x} = \frac{60}{100}$$

$$\frac{60x}{60} = \frac{3750}{60}$$

$$x = 62.5$$

10. What percent of 175 is 35?

$$\frac{35}{175} = \frac{x}{100}$$

$$\frac{175x}{175} = \frac{3500}{175}$$

$$x = 20\%$$

11. Ms. Brown and her Mom ate lunch at Olive Garden over the weekend. The total bill was \$36.95. They left a 15% tip. How much did they leave?

$$36.95 \cdot 0.15 = 5.5425$$

\$5.54

They left about \$5.54 as a tip.

Find each percent change. Tell whether it is a percent increase or decrease. Round your answer to the nearest percent.

12. From 180 to 234

$$\frac{234 - 180}{180} \cdot 100$$

180

$$\frac{54}{180} \cdot 100 = 0.3 \cdot 100$$

$$= 30\% \text{ Increase}$$

$$\frac{\text{New} - \text{Original}}{\text{Original}} \cdot 100$$

13. From 56 to 21

$$\frac{21 - 56}{56} \cdot 100$$

56

$$-\frac{35}{56} \cdot 100 = -0.625 \cdot 100 = 62.5\%$$

63% Decrease

14. Tom sells sunglasses that he buys wholesale for \$2.50 each. He then marks up the price 150%. What is the amount of the markup? What is the selling price?

$$\text{mark up} = 2.5 \cdot 1.5 = \$3.75$$

$$\text{Selling Price} = 2.5 + 3.75 = \$6.25$$

The mark up is \$3.75 and selling price is \$6.25.

15. A leather jacket that originally costs \$175.00 is on sale for 35% off. What is the sale price of the jacket?

$$100\% - 35\% = 65\%$$

$$175 \cdot 0.65 = \$113.75$$

The sale price of the jacket is \$113.75

Solve each equation for the variable indicated.

16. $15 = 3n + 6p$ for n

$$\begin{array}{r} -6p \quad -6p \\ \hline 15 - 6p = 3n \\ \hline 3 \end{array}$$

$$\frac{15 - 6p}{3} = n$$

$$5 - 2p = n$$

$$n = 5 - 2p$$

17. $\frac{k-2}{5} = 11j$ for k

$$\begin{array}{r} k-2 = 55j \\ +2 \quad \quad +2 \end{array}$$

$$k = 55j + 2$$

18. $28 = t(r+4)$ for t

$$\frac{28}{(r+4)} = t$$

$$\frac{28}{(r+4)} = t$$

$$t = \frac{28}{(r+4)}$$

19. $a(q-8) = 23$ for q

$$\begin{array}{r} aq - 8a = 23 \\ +8a \quad \quad +8a \end{array}$$

$$\frac{aq}{a} = \frac{23 + 8a}{a}$$

$$q = \frac{23 + 8a}{a}$$

20. $d + 5c = 3d - 1$ for d

$$\begin{array}{r} -3d \quad -3d \\ \hline -2d + 5c = -1 \\ \quad -5c \quad -5c \end{array}$$

$$\frac{-2d}{-2} = \frac{-1 - 5c}{-2}$$

$$d = \frac{-1 - 5c}{-2}$$

$$d = \frac{1 + 5c}{2}$$

21. The world's largest yo-yo is 32.7 feet in circumference. It was launched by crane from a height of 189 feet. The formula for the circumference of a circle is $C = 2\pi r$, where C represents circumference and r represents radius

a. Solve the formula for r

$$\frac{C = 2\pi r}{2\pi} \quad \frac{2\pi r}{2\pi}$$

$$\frac{C}{2\pi} = r$$

$$r = \frac{C}{2\pi}$$

b. Find the radius of the yo-yo.

$$r = \frac{32.7}{(2 \cdot \pi)}$$

$$32.7 \div (2 \cdot \pi)$$

$$r \approx 5.204366639$$

The radius of the yo-yo is 5.2 ft

22. A fisheye lens has a minimum focus range of 13.5 centimeters. If 1 centimeter is equal in length to about 0.39 inches, what is the minimum focus range of the lens in feet?

$$\frac{13.5 \text{ cm}}{1} \cdot \frac{0.39 \text{ in}}{1 \text{ cm}} = \frac{13.5 \cdot 0.39}{1 \cdot 1}$$

$$= 5.265 \text{ in}$$

$$\frac{5.265 \text{ in}}{1} \cdot \frac{1 \text{ ft}}{12 \text{ in}} = \frac{5.265}{12} = 0.43875 \text{ ft}$$

The minimum focus range is about 0.43875 ft

23. How many liters of gasoline are needed to fill a 13.2 gallon tank? There are about 1.06 quarts per 1 liter and 4 quarts per 1 gallon. Round to the nearest tenth.

$$\frac{13.2 \text{ gal}}{1} \cdot \frac{4 \text{ qt}}{1 \text{ gal}} \cdot \frac{1 \text{ L}}{1.06 \text{ qt}}$$
$$= \frac{13.2 \cdot 4 \cdot 1}{1 \cdot 1 \cdot 1.06} = \frac{52.8}{1.06} \approx 49.81132075$$

49.8 L

It would take about 49.8 L to fill a 13.2 gallon tank.

Find the final price of each item

24. Lamp: \$120.00, Tax: 6%

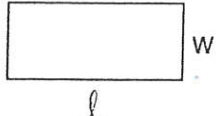
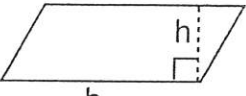
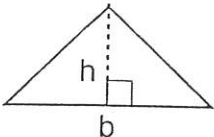
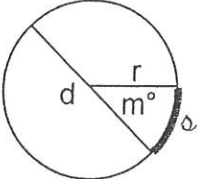
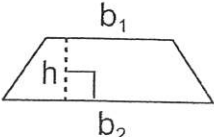
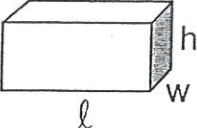
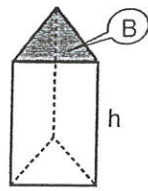
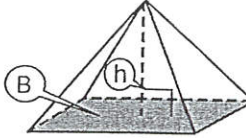
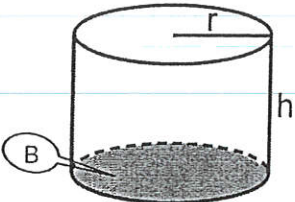
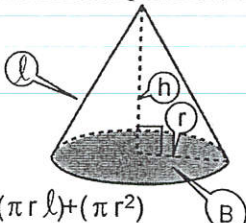
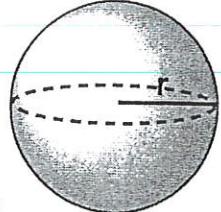
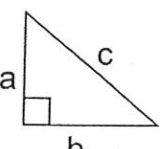
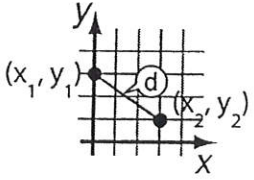
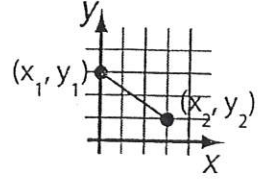
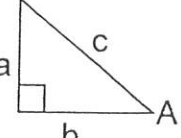
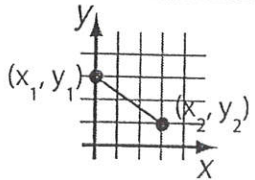
$$100\% + 6\% = 106\%$$

$$120 \cdot 1.06 = \$127.20$$

25. Camera \$58.00, Discount 25%

$$100\% - 25\% = 75\%$$

$$58 \cdot 0.75 = \$43.50$$

MEASUREMENTS	1 meter = 100 centimeters 1 kilometer = 1000 meters 1 yard = 3 feet 1 mile = 5280 feet 1 hour = 60 minutes 1 minute = 60 seconds	1 gram = 1000 milligrams 1 kilogram = 1000 grams 1 pound = 16 ounces 1 ton = 2000 pounds	1 liter = 1000 cubic centimeters 1 cup = 8 fluid ounces 1 pint = 2 cups 1 quart = 2 pints 1 gallon = 4 quarts
AREA (A)	 $A = lw$	 $A = bh$	 $A = \frac{1}{2} bh$
	 $A = \pi r^2$ $C = 2\pi r = \pi d$ Arc Length: $s = \left(\frac{m}{360}\right) 2\pi r$		 $A = \frac{1}{2} h (b_1 + b_2)$
SURFACE AREA (SA) and VOLUME (V)	 $SA = 2(lw + wh + lh)$ $V = lwh = Bh$ B = Area of Base	 $SA = \text{Sum of Areas of all faces}$ $V = Bh$ B = Area of Base	 $SA = \text{Sum of Areas of all faces}$ $V = \frac{1}{3} Bh$ B = Area of Base
	 $SA = 2\pi rh + 2\pi r^2$ $V = \pi r^2 h = Bh$ B = Area of Base	 $SA = (\pi r l) + (\pi r^2)$ $V = \left(\frac{1}{3}\pi r^2\right)(h) = \frac{1}{3} Bh$ B = Area of Base	 $SA = 4\pi r^2$ $V = \frac{4}{3}\pi r^3$
	 $a^2 + b^2 = c^2$	 $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	 $\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
	 $\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$ $\tan A = \frac{a}{b}$		 $\text{Slope: } m = \frac{y_2 - y_1}{x_2 - x_1}$