

Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

## Ratios, Proportions, and Percents STUDY GUIDE

Competency 1 - Apply the Mathematical Practices as they relate to Number Sense.	3 - MS	2 - PMS	1 - DNM
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Competency 4 - Learning Target #7: I can find the percent of a number.	3 - MS	2 - PMS	1 - DNM
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DIRECTIONS: Calculate the percent of the number. Round answer to the nearest hundredth. SHOW YOUR WORK!

1.) What is 16% of 95?

$$\frac{x}{95} = \frac{16}{100} \quad 100x = 16(95)$$

$$\frac{100x}{100} = \frac{1520}{100}$$

$$x = 15.2$$

2.) What is 4% of 135?

$$\frac{x}{135} = \frac{4}{100} \quad 100x = 4(135)$$

$$\frac{100x}{100} = \frac{540}{100}$$

$$x = 5.4$$

3.) What is 223% of 183?

$$\frac{x}{183} = \frac{223}{100} \quad 100x = 223(183)$$

$$\frac{100x}{100} = \frac{40809}{100}$$

$$x = 408.09$$

4.) What is 0.6% of 9?

$$\frac{x}{9} = \frac{0.6}{100} \quad 100x = 0.6(9)$$

$$\frac{100x}{100} = \frac{5.4}{100}$$

$$x = 0.05$$

Competency 4 - Learning Target #8: I can find what percent of a number is of another number.	3 - MS	2 - PMS	1 - DNM
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DIRECTIONS: Calculate the missing part, whole, or percent. Round answer to the nearest hundredth. SHOW YOUR WORK!

5.) 8 is what percent of 64?

$$\frac{8}{64} = \frac{x}{100} \quad 64x = 8(100)$$

$$\frac{64x}{64} = \frac{800}{64}$$

$$x = 12.5$$

6.) 63 is 32% of what number?

$$\frac{63}{x} = \frac{32}{100} \quad 32x = 63(100)$$

$$\frac{32x}{32} = \frac{6300}{32}$$

$$x = 196.88$$

7.) 45% of 231 is what number?

$$\frac{x}{231} = \frac{45}{100} \quad 100x = 45(231)$$

$$\frac{100x}{100} = \frac{10395}{100}$$

$$x = 103.95$$

8.) What percent of 20 is 1.3?

$$\frac{1.3}{20} = \frac{x}{100} \quad 20x = 1.3(100)$$

$$\frac{20x}{20} = \frac{130}{20}$$

$$x = 6.5$$

9.) 83% of 33 is what number?

$$\frac{x}{33} = \frac{83}{100} \quad 100x = 83(33)$$

$$\frac{100x}{100} = \frac{2739}{100}$$

$$x = 27.39$$

10.) 313 is 92% of what number?

$$\frac{313}{x} = \frac{92}{100} \quad 92x = 313(100)$$

$$\frac{92x}{92} = \frac{31300}{92}$$

$$x = 340.22$$

3 - MS

2 - PMS

1 - DNM

Competency 4 - Learning Target #9: I can calculate sales tax, tips, and markups given their percent increase.

DIRECTIONS: Calculate the tip, sales tax, or markup. Round answer to the nearest hundredth. SHOW YOUR WORK!

- 11.) Julia's family went out for dinner. The meal cost \$84.93 and they left a 20% tip. How much money did Julia's family pay for dinner, including the tip?

$$\begin{array}{r}
 \$84.93 \\
 10\% = 8.49 \\
 \times \quad 2 \\
 \hline
 20\% = 16.98 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 84.93 \text{ check} \\
 + 16.98 \text{ tip} \\
 \hline
 \text{\$101.91 TOTAL}
 \end{array}$$

- 12.) Hope found \$97.49 running shoes at Super Shoes. There is a 7% sales tax on the shoes. How much did Hope pay for her shoes, including the sales tax?

$$\begin{array}{r}
 x \\
 \hline
 97.49 = \frac{7}{100}
 \end{array}$$

$$\begin{array}{r}
 100x = 7(97.49) \\
 \frac{100x}{100} = \frac{682.43}{100} \\
 x = 6.82
 \end{array}$$

$$\begin{array}{r}
 97.49 \text{ price} \\
 + 6.82 \text{ tax} \\
 \hline
 \text{\$104.31}
 \end{array}$$

- 13.) Nick went to Green Leaves and his food bill came to \$23.95.

- a.) If there was an 8% tax, how much was Nick's meal including tax?

$$\begin{array}{r}
 8\% \text{ of } 23.95 = \\
 0.08 \times 23.95 = \$1.92
 \end{array}$$

$$\begin{array}{r}
 23.95 \\
 + 1.92 \\
 \hline
 \text{\$25.87}
 \end{array}$$

- b.) How much money did Nick pay after also included a 20% tip?

$$\begin{array}{r}
 20\% \text{ of } 25.87 \\
 .2 \times 25.87 = \$5.17 \text{ tip}
 \end{array}$$

$$\begin{array}{r}
 25.87 \\
 + 5.17 \\
 \hline
 \text{\$31.04} \\
 \text{including tax \& tip}
 \end{array}$$

3 - MS

2 - PMS

1 - DNM

Competency 4 - Learning Target #10: I can calculate a percent discount.

DIRECTIONS: Calculate the percent discount. Round answer to the nearest hundredth. SHOW YOUR WORK!

- 14.) The price of a winter hat that Matt is buying was \$23.99. What is the price of the hat after a 30% discount?

$$\begin{array}{r}
 .30 \times 23.99 = \$7.20 \\
 \begin{array}{r}
 23.99 \\
 - 7.20 \\
 \hline
 \text{\$16.79}
 \end{array}
 \end{array}$$

15.) A season pass to Water Country costs \$117.95. If a student buys their season pass in May, they get a 25% discount.

a.) If Aili buys her Water Country pass in May, how much money does she save?

$$25\% \text{ of } 117.95$$

$$.25 \times 117.95 = \$29.49$$

b.) What did Aili pay for her season pass to Water Country (after the discount)?

$$117.95$$

$$- 29.49$$

$$= \$88.46$$

	3 - MS	2 - PMS	1 - DNM
Competency 4 - Learning Target #11: I can recognize proportional and nonproportional relationships when referencing a table, graph, and equation.			

DIRECTIONS: Identify if the relationship is proportional or nonproportional. SHOW YOUR WORK!

16.) A grocery store sells 6 bottles of water for \$3.50 and 18 bottles of water for \$12.00. Is the cost of the water proportional to the number sold? Explain.

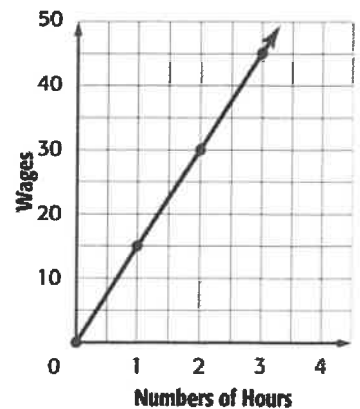
6 bottles →  $\frac{6}{3.50} = 0.58$  (cost per bottle)

18 bottles →  $\frac{18}{12} = 0.67$  (cost per bottle)

Not proportional

17.) The graph shows the amount of money Maggy earns each hour she works. Does the graph show a proportional or nonproportional relationship? Explain.

proportional! Every hour that passes, Maggy earns the same amount of money.



18.) The table shows the cost for ordering a certain number of tacos. Is the tacos price proportional or nonproportional to the number of tacos ordered? Explain.

3 - MS

2 - PMS

1 - DNM

Competency 4 - Learning Target #12: I can identify the unit rate in a situation looking at a table, graph, and equation of a proportional relationship.

DIRECTIONS: Identify the unit rate in each situation below.

- 19.) What is the unit rate if there are 114 miles driven using 6 gallons of gas?

$$\frac{\text{miles}}{\text{gal}} = \frac{114 \div 6}{6 \div 6} = \frac{19 \text{ miles}}{1 \text{ gal}} \quad 19 \text{ miles/gal}$$

- 20.) What is the unit rate of the table below?

<b>Seconds</b>	10	20	30	40
<b>Meters</b>	40	80	120	160

$$\frac{10}{40} = \frac{1}{4} \quad \frac{20}{80} = \frac{1}{4} \quad 4 \text{ meters/sec}$$

$$\frac{30}{120} = \frac{1}{4} \quad \frac{40}{160} = \frac{1}{4}$$

- 21.) Which size can of soup shown in the table has the lowest unit price?

Size (oz)	Cost (\$)
10	0.79
15	1.29
18	2.16
32	3.19

$$\frac{0.79}{10} = 0.079\text{\$ per oz}$$

$$\frac{1.29}{15} = 0.086\text{\$ per oz}$$

$$\frac{2.16}{18} = 0.12\text{\$ per oz}$$

$$\frac{3.19}{32} = 0.099\text{\$ per oz}$$

10 oz. can  
lowest price  
per oz.

3 - MS

2 - PMS

1 - DNM

Competency 4 - Learning Target #13: I can explain what a point on the graph of a proportional relationship means in terms of the situation.

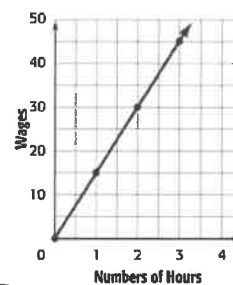
DIRECTIONS: Answer the questions below looking at the graph below.

- 22.) What does the point at (2, 30) mean?

After 2 hours the person has made \$30

- 23.) Why is the line on the graph a straight line? Explain.

It is a proportional situation.



Competency 4 - Learning Target #14: I can solve proportions.			
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DIRECTIONS: Solve the proportion. Round to the nearest hundredth when necessary.

$$24.) \quad \frac{22}{11} = \frac{4}{x}$$

$$22x = 4(11)$$

$$\frac{22x}{22} = \frac{44}{22}$$

$$x = 2$$

$$25.) \quad \frac{s}{15} = \frac{4}{25}$$

$$25s = 4(15)$$

$$\frac{25s}{25} = \frac{60}{25}$$

$$s = 2.4$$

$$26.) \quad \frac{62}{146} = \frac{t}{59}$$

$$146t = 62(59)$$

$$146t = 3658$$

$$t = 25.05$$

$$27.) \quad \frac{1}{4} = \frac{x}{89}$$

$$\frac{4x}{4} = \frac{89(1)}{4}$$

$$x = 22.25$$

$$28.) \quad \frac{r}{5} = \frac{3}{19}$$

$$19r = 3(5)$$

$$\frac{19r}{19} = \frac{15}{19}$$

$$r = 0.79$$

$$29.) \quad \frac{6.2}{46} = \frac{4}{c}$$

$$6.2c = 4(46)$$

$$\frac{6.2c}{6.2} = \frac{184}{6.2}$$

$$c = 29.68$$

