

Unit 3 Study Guide/Practice Test

1. Jeremy drove $54\frac{1}{4}$ miles in 45 minutes. If he drove at a constant rate, what is his speed in miles per hour? (Hint: What fraction of an hour is 45 minutes?) $\frac{54\frac{1}{4}}{\frac{3}{4}} = 54\frac{1}{4} \div \frac{3}{4} = \frac{217}{4} \cdot \frac{4}{3} = \frac{217}{3} = 72\frac{1}{3}$
 His speed is $72\frac{1}{3}$ mph.

2. The table below shows the cost for ordering a certain number of tacos. What is the value of x if the cost is proportional to the number of tacos ordered?

(8 tacos cost \$10.40)

Cost, x	2	4	6	8
Tacos, y	\$2.60	\$5.20	\$7.80	x

- constant = 1.3
 - cost of 1 taco = \$1.30
 - cost of 8 tacos = $8(1.30) = 10.40$

3. Determine the constant of proportionality in the linear function below.

Pants, x	10	11	12	13
Shoes, y	20	22	24	26

Constant of proportionality: 2 shoes per pants.

4. Solve the proportion:

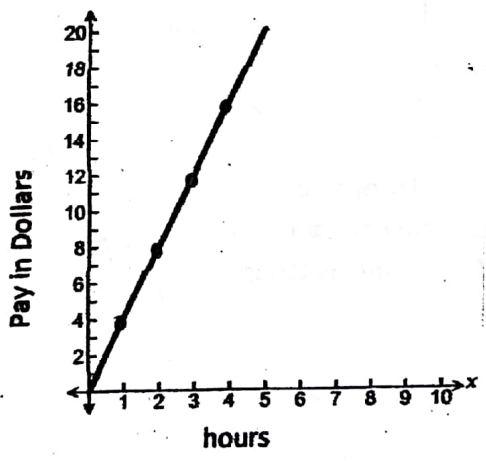
$\frac{3}{7} = \frac{n}{28}$ $n = 12$ $7n = 84$
 $\frac{7n}{7} = \frac{84}{7}$
 $n = 12$

5. What is the solution to the proportion?

$\frac{3}{22} = \frac{6}{n}$ $n = 44$ $3n = 132$
 $\frac{3n}{3} = \frac{132}{3}$
 $n = 44$

6. What is the constant rate of change of the graph?

Constant rate of change: \$4 per hour
 $\frac{4}{1} = 4$ $\frac{8}{2} = 4$ $\frac{12}{3} = 4$



7. What is the rate of change (constant of proportionality) in the graph below? (Hint: Look at the change in the y values over the change in x values, then simplify.)

x	5	6	8	12
y	4	4.8	6.4	9.6

Constant rate of change: 0.8
 $\frac{4}{5} = .8$ $\frac{4.8}{6} = .8$ $\frac{6.4}{8} = .8$ $\frac{9.6}{12} = .8$

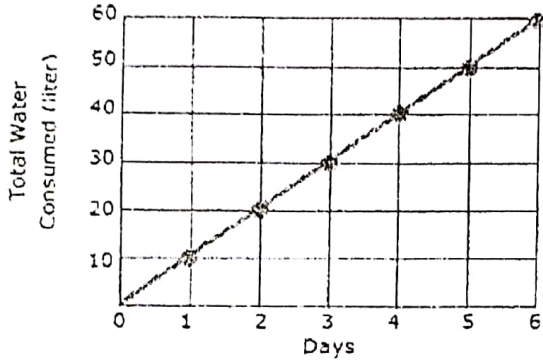
8. What is the constant rate of change of the table below?

x	1	2	3	4
y	2.2	4.4	6.6	8.8

$\frac{2.2}{1} = 2.2$ $\frac{4.4}{2} = 2.2$ $\frac{6.6}{3} = 2.2$ $\frac{8.8}{4} = 2.2$

Constant rate of change: 2.2

9. What is the rate of change of the line?



Constant rate of change:

10 Liters of water consumed per day

10. Jackson mows lawns in his neighborhood. The equation $y = 12x$ represents the amount of money he earns for each lawn, x , that he mows. What is the constant of proportionality? \$12

11. The mountain bikers were one quarter finished with their race at the 2 mile mark of the track. How long was their total ride going to be by the time they finished?

way 1: $\frac{2 \text{ mi}}{\frac{1}{4}} = \frac{x}{1} \rightarrow 2 = \frac{1}{4}x \rightarrow x = 8$

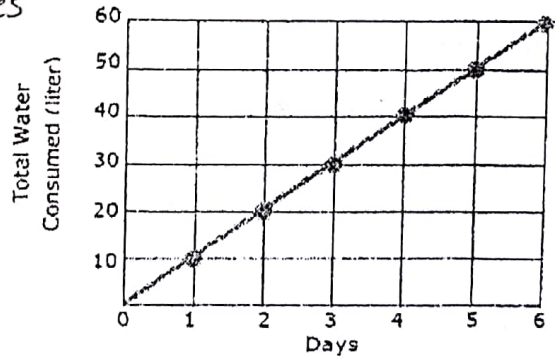
way 2: $\frac{2 \text{ mi}}{\frac{1}{4}} = \frac{2}{\frac{1}{4}} = 2 \div \frac{1}{4} = 2 \cdot \frac{4}{1} = \frac{8}{1}$

way 3: $\frac{2 \text{ mi}}{\frac{1}{4}} = \frac{x}{1} \rightarrow 2 = \frac{1}{4}x \rightarrow x = 8$

Diagram: A number line from 0 to 8 miles with markers at 2, 4, 6, and 8. Fractions $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1$ are written below the markers. An arrow points from the 8 mark to the text "All the way finished w/ race."

12. The graph shows the amount of total liters of water consumed over days. Which statement about the graph is not true?

- a. The graph shows a proportional relationship. yes
- b. The graph shows a non-proportional relationship. no
- c. The unit rate is \$10 per day. yes
- d. The line is straight. yes



Find unit rate:

13. If it takes 16 gallons of gas to drive 320 miles, how many miles can be driven using 22 gallons of gas?

way 1: $\frac{320 \text{ m}}{16 \text{ g}} = 20 \rightarrow 20(22) = 440 \text{ mi}$

way 2: $\frac{320 \text{ m}}{16 \text{ g}} = \frac{x \text{ m}}{22 \text{ g}} \rightarrow 16x = 7040 \rightarrow x = 440 \text{ mi}$

OR Set up a proportion

14. Maria can travel 195 miles in 3 hours. At this rate, how many miles can she drive in 5 hours?

She can drive 325 miles in 5 hours. $\frac{195 \text{ m}}{3 \text{ h}} = 65 \text{ mph} \rightarrow 65(5) = 325 \text{ miles}$

OR $\frac{195}{3} = \frac{x}{5} \rightarrow 3x = 975 \rightarrow x = 325$

15. 20% of the 30 soccer team members are new on the team. How many members are new?

There are 6 new members on the team. $.20(30) = 6$

$20\% = .20$

x = 325

16. Lily spent \$52.00 total on clothes at Target. She forgot to use a 25% off coupon when she checked out. What would have been her discount if she had used the coupon? $25\% = .25$

$52(.25) = 13$ This is the discount.

Her discount would have been \$13.00. she would have gotten \$13.00 off the regular price.

17. Bob had dinner at Macaroni Grill. His bill was \$26.53. What is the amount he should leave for the waitperson for a 15% tip? Round to the nearest dollar. $15\% = .15$

$26.53(.15) = 3.9795$

He should leave \$4.00 for the tip.

18. Computers at Joe's Electronics are discounted 20%. If the tax rate is 7%, how much will a \$350 computer from Joe's Electronics cost after discount and tax? $350(.20) = 70$ Find discount.
 $350 - 70 = 280$ subtract discount.
 $(20\% = .20 \text{ and } 7\% = .07)$

It will cost \$299.60 after discount and tax.

new amount: $280(.07) = 19.80$ Find tax.
 $280 + 19.80 = 299.60$ Add tax.

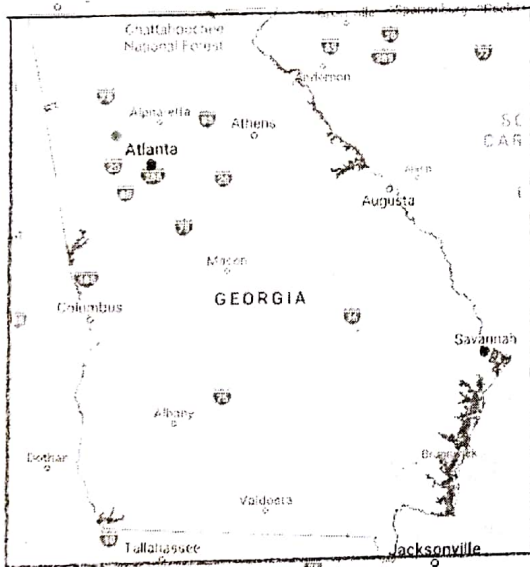
19. On a map, 1 cm represents 50 miles. Find the actual distance between two cities if they are 4.8 cm apart on the map. (Hint: set up a proportion.)

$\frac{50 \text{ mi}}{1 \text{ cm}} = \frac{x \text{ mi}}{4.8 \text{ cm}}$
 $x = 50(4.8)$
 $x = 240$

The actual distance is 240 miles.

20. The actual distance between Atlanta and Savannah is 235 miles. Determine the scale used on the map below if the distance is 5 cm.

The scale used on the map below is 1 cm : 47 miles.



$\frac{x \text{ mi}}{1 \text{ cm}} = \frac{235 \text{ mi}}{5 \text{ cm}}$

$\frac{5x}{5} = \frac{235}{5}$

$x = 47$