

## Unit 8 (Rates, Ratios, Proportions, Scale Drawings)

1. Find the unit rate: \$9.60 for 4 pounds.

2. Find the unit rate:  $21\frac{3}{4}$  meters in  $2\frac{1}{2}$  hours

3. One gallon of paint covers about 325 sq. ft. How many sq. ft. will 4.5 gallons of paint cover?

4. The rates of two runners is below:

Runner A: 2.5 hours for 15 miles

Runner B: 1.5 hours for 12 miles

a.) What is the unit rate in miles per hour for each runner?

b.) Which runner is faster?

c.) Another runner can run 0.1 miles per minute. Find his rate per hour.

5. Dan and Sara are competing in a 20-mile bicycle race. Dan rides 6.2 miles in  $\frac{1}{4}$  hour. Sara rides 11.9 miles in  $\frac{1}{2}$  hour.

a.) What is the unit rate in miles per hour for each racer?

b.) If both riders continue, who will finish first? Justify.

6. Explain whether the table shows a proportional relationship.

<b>x (hours)</b>	1	4	7	10
<b>y (feet)</b>	5	20	35	50

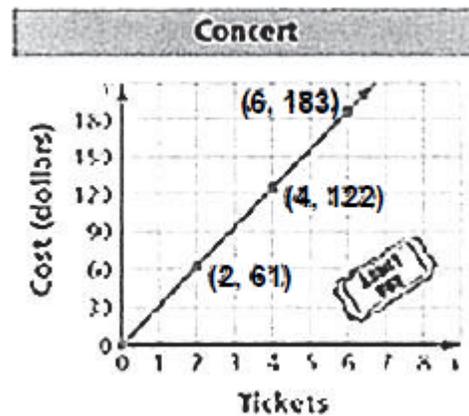
7. The ratio of trombones to violas is 1 to 3. If there are 9 violas, write and solve a proportion to find how many trombones there are.

8. Using the graph below, answer the following:

a.) What does the point (4,122) represent?

b.) What is the unit rate?

d.) What is the price for 5 tickets?



9. Which car is not traveling at a constant speed? Explain.

Car 1	
Hours	Miles
0	0
2	120
3	180
5	300
6	360

Car 2	
Hours	Miles
0	0
5	200
10	400
15	600
20	800

Car 3	
Hours	Miles
0	0
1	65
2	85
3	105
4	125

10. The scale of a model train is 1 inch to 13.5 feet. One of the cars of the model train is 5 inches long. What is the length, in feet, of the actual car?

11. A crew of highway workers paved  $\frac{2}{15}$  mile in 20 minutes. If they work at the same rate, what portion of a mile will they pave in one hour?

12. Last week Len spent \$18 to bowl 4 games. This week he spent \$27 to bowl 6 games. Len owns his bowling ball and shoes, so he only has to pay for each game that he bowls. If each of the bowling games cost the same amount of money, what is the constant of proportionality between the money spend and the number of games played?

A. 1.5

B. 2.0

C. 4.5

D. 9.0

13. Mr. Huntley gave his class 20 minutes to read their books. Lianna read  $8\frac{1}{2}$  pages during that time. At what rate, in pages per hour, did Lianna read?

14. The cost of oranges in a grocery store is directly proportional to the number of oranges purchased. Jerri paid \$2.52 for 6 oranges. If  $p$  represents the cost, in dollars, and  $n$  represents the number of oranges purchased, which equation best represents this relationship?

A.  $p = 0.42n$

B.  $p = 2.52n$

C.  $p = 6n$

D.  $15.12n$

15. The graph below shows the relationship between the number of people in a group and the total cost of admission tickets for a circus.

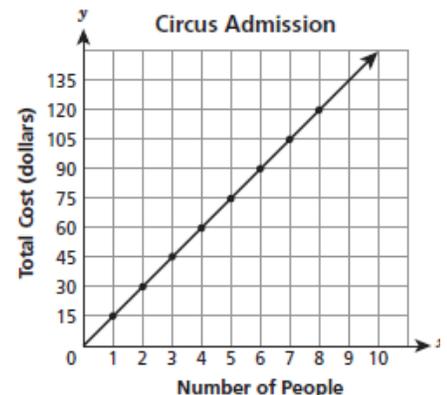
What point on the graph represents the unit rate?

A. (0,0)

B. (1,15)

C. (15,1)

D. (8,120)



16. A recipe requires  $\frac{1}{3}$  cup of milk for each  $\frac{1}{4}$  cup of water. How many cups of water are needed for each cup of milk?

A.  $\frac{1}{12}$

B.  $\frac{3}{4}$

C.  $\frac{11}{12}$

D.  $1\frac{1}{3}$

17. The price of fencing at Bargain Hardware can be determined by the equation  $y = 2.50x$  where  $y$  is the price, in dollars, for  $x$  feet. The table shown below is the price of fencing at Andy's Hardware.

Price of Fencing	
Length (ft)	Price
75	\$168.75
125	\$281.25
175	\$393.75
225	\$506.25

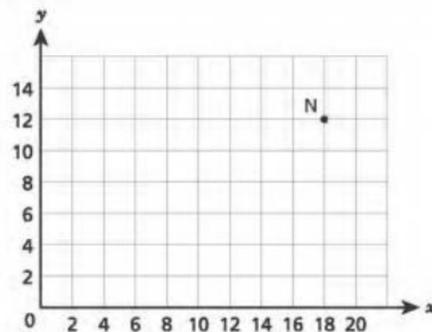
a.) What is the unit price, in dollars per foot, for each store?

Bargain Hardware \$ \_\_\_\_\_ per foot

Andy's Hardware \$ \_\_\_\_\_ per foot

b.) How much does Bargain Hardware charge for 5 yards of fencing?

18. If line KN is a proportional relationship, and point N lies at (18,12) as shown on the graph, which ordered pair could represent the coordinates of point K?



A. (6,0)

B. (2,3)

C. (1.5, 0)

D. (7.5, 5)

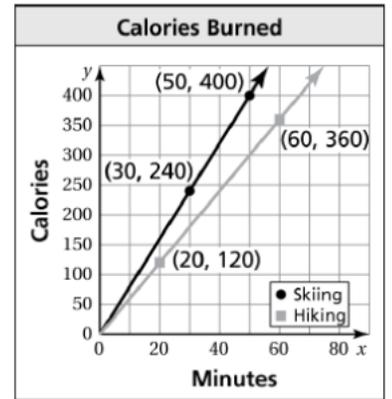
19. At their annual car wash, the science club washes 30 cars in 45 minutes. At this rate, how many cars will they wash in 1 hour?

20. The graph shows the calories burned for hiking and downhill skiing.

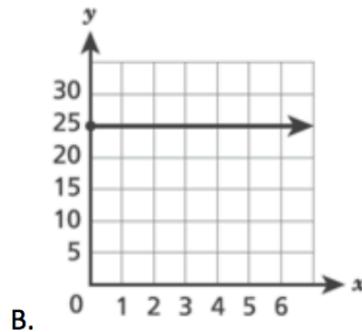
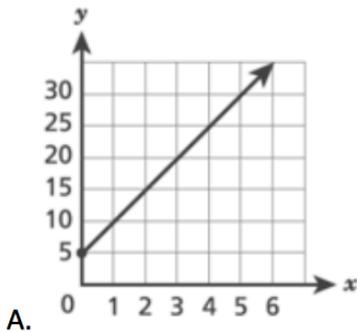
a.) Interpret the point  $(20, 120)$  and  $(50, 400)$ .

b.) Find the constant of proportionality for each line.

c.) Write an equation for each line.



21. Which representation below shows a proportional relationship between  $x$  and  $y$ ?



C. 

$x$	$y$
2	8
4	16
8	24
12	32

D. 

$x$	$y$
2	3
4	6
8	12
12	18