Name: _____ Period: _____

Unit 2 Assessment: Ratios & Proportions Study Guide

Non-Calculator

1. Ruben put an empty cup underneath a leaking faucet. After $1\frac{1}{2}$ hours, Ruben had collected $\frac{1}{4}$ cup of water. What is the rate, in cups per hour, at which the water is leaking from the faucet?

A. $\frac{1}{6}$

B. $\frac{3}{8}$

C. $\frac{8}{3}$

D. $\frac{6}{1}$

$$\frac{\frac{1}{4}}{1\frac{1}{2}} \quad \frac{\frac{1}{4}}{\frac{3}{2}} = \frac{x}{1}$$

$$\frac{3}{2}x = \frac{1}{4}$$

$$\frac{2}{3}\cdot\frac{3}{2}x = \frac{1}{4}\cdot\frac{2}{3} \qquad x = \frac{2}{12} = \frac{1}{6}$$

Rosy waxes $\frac{2}{3}$ of her car with $\frac{1}{4}$ bottle of car wax.

At this rate, what fraction of the bottle of car wax will Rosy use to wax her entire car?

Ⓐ $\frac{1}{8}$

Ⓑ $\frac{1}{6}$

Ⓒ $\frac{3}{8}$

Ⓓ $\frac{3}{4}$

$$\frac{\frac{1}{4}}{\frac{2}{3}} = \frac{x}{1}$$

$$\frac{2}{3}x = \frac{1}{4} \qquad x = \frac{3}{8}$$

$$\frac{3}{2}\cdot\frac{2}{3}x = \frac{1}{4}\cdot\frac{3}{2}$$

Suppose that a butterfly can fly 82 feet in 4 seconds. A dragonfly can fly 50 feet in 2 seconds. Which can fly faster and by how much?

A The dragonfly is 4.5 feet per second faster.

B The dragonfly is 20.5 feet per second faster.

C The butterfly is 4.5 feet per second faster.

D The butterfly is 24 feet per second faster.

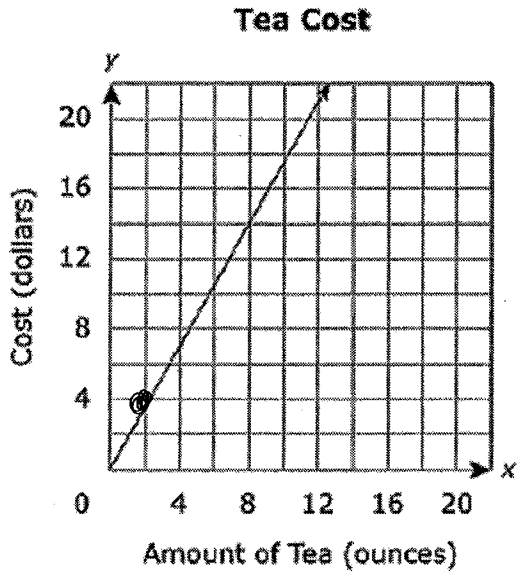
butterfly

$$\frac{82\text{ ft}}{4\text{ sec}} = \frac{20.5\text{ ft}}{1\text{ sec}}$$

dragonfly

$$\frac{50\text{ ft}}{2\text{ sec}} = \frac{25\text{ ft}}{1\text{ sec}}$$

The relationship between the number of ounces of tea purchased and the total cost of the tea is proportional, as shown in this graph.



Which equation models this relationship?

- A. $y = \frac{1}{4}x$
- B. $y = \frac{4}{1}x$
- C. $y = \frac{4}{7}x$
- D. $y = \frac{7}{4}x$

$\frac{4}{1}$ $\frac{\text{rise}}{\text{run}}$

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 these bowling games costs the same amount of money, what is the constant of proportionality between the money spent and the number of games played?

A 1.5

B 2.0

C 4.5

D 9.0

$\frac{18}{4} = \frac{4.5}{1}$

The table below represents a relationship between the time a turtle walks and the distance the turtle travels.

Time and Distance Turtle Walks

Time (minutes)	Distance (feet)
5	120
20	480
30	720
50	1,200

What is the unit rate represented in this table?

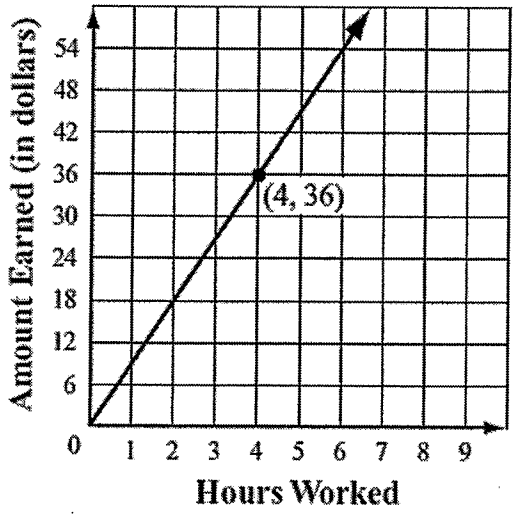
Enter your answer in the box.

24 feet per minute

$\frac{120\text{ ft}}{5\text{ min}} \overset{\div 5}{=} \frac{24\text{ ft}}{1\text{ min}}$

Narita works part time on Saturdays. The graph below shows the relationship between the number of hours Narita works on Saturdays and the total amount of money she earns.

Narita's Earnings



a. What does the point (4, 36) on the graph represent in this situation?
Narita earns $36 for 4 hours of work.

b. What does the point (0, 0) on the graph represent in this situation?
Narita earns $0 when she works for 0 hrs.

c. What is the amount of money, in dollars, that Narita earns for each hour she works? Show or explain how you got your answer. $\frac{\$36}{4} \overset{\div 4}{=} \frac{9}{1}$ $9/hr I found the unit rate.

d. Write an equation that could be used to find t, the total amount of money Narita earns for working h hours.

$t = 9h$

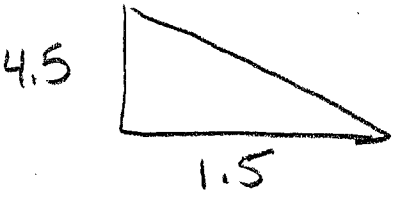
A right triangle has legs measuring 4.5 meters and 1.5 meters.

The lengths of the legs of a second triangle are proportional to the lengths of the legs of the first triangle.

Which could be the lengths of the legs of the second triangle?

Select **each** correct pair of lengths.

- (A) 6 m and 2 m
- (B) 8 m and 5 m
- (C) 7 m and 3.5 m
- (D) 10 m and 2.5 m
- (E) 11.25 m and 3.75 m



$\frac{4.5}{1.5} = \frac{3}{1}$

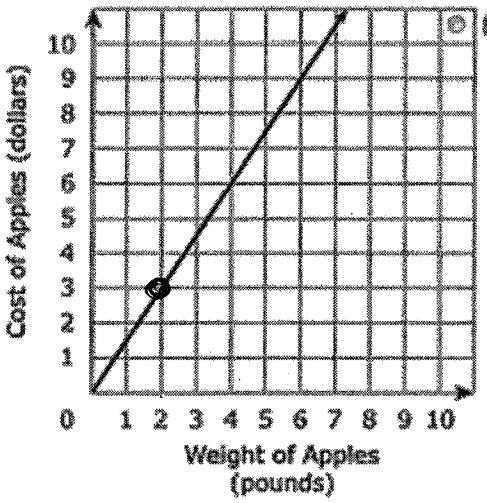
a) $\frac{6}{2} = \frac{3}{1}$ c) $\frac{7}{3.5} = \frac{2}{1}$ not $\frac{3}{1}$

b) $\frac{8}{5} = \frac{1.75}{1}$ not $\frac{3}{1}$ d) $\frac{10}{2.5} = \frac{4}{1}$ not $\frac{3}{1}$

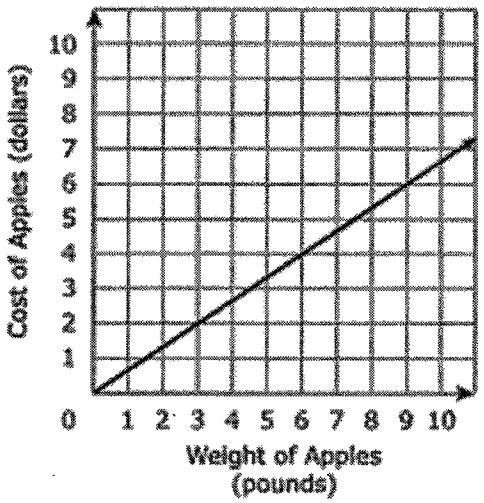
e) $\frac{11.25}{3.75} = \frac{x}{1} = \frac{3}{1}$ yes

10. At a local market, the cost of apples is directly proportional to the weight of the apples. Carlos bought 10 pounds of apples for a cost of $15.00. Which graph shows the relationship between the weight of the apples, in pounds, and the cost of the apples, in dollars?

(A)



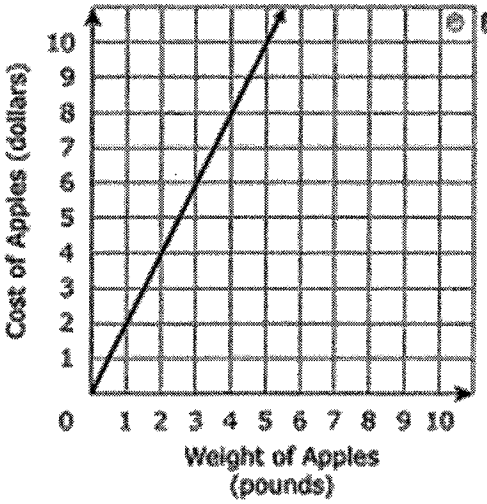
B.



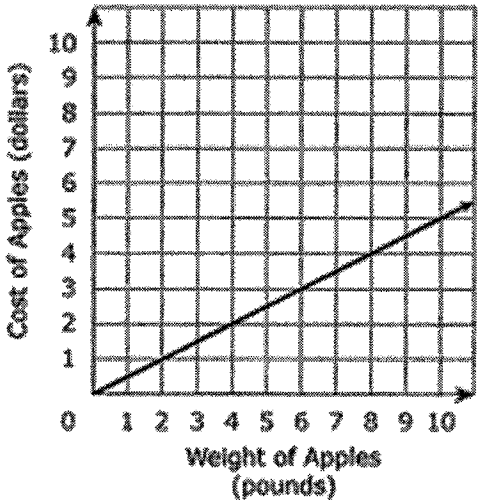
$\frac{\$15}{10} = \frac{\$3}{2}$

(10, 15)

C.

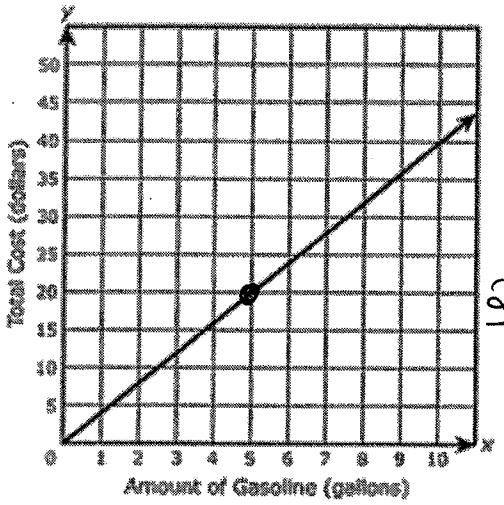


D.



14. The graph and table show the amount of gasoline in gallons, x, and total cost in dollars, y, of gasoline at two gas stations.

Gas Station P



$\frac{20}{5} = \frac{\$4}{1 \text{ gal}}$

Gas Station M

x	y
5	19.00
10	38.00
15	57.00

$\frac{\$19}{5} \overset{\div 5}{=} \frac{\$3.80}{1}$ $\div 5$

Use the unit price of gasoline at both gas stations to determine which gas station charges more for gasoline (gallons). Be sure to include the unit prices in your answer. Show or explain your work.

gas station P charges more

15.

A scale factor of 3.5 maps Figure A onto Figure B.

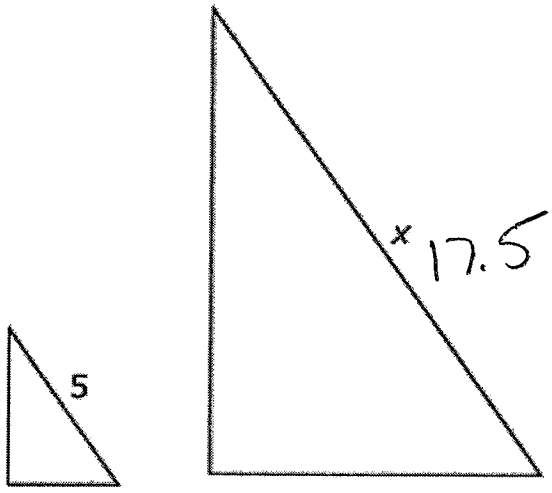


Figure A Figure B

$\begin{array}{r} 23.5 \\ \times \quad 5 \\ \hline 17.5 \end{array}$

Enter the value of x. 17.5

5. Allen made a scale drawing of his rectangular classroom. He used the scale $\frac{1}{2}inch = 4\,feet$. His actual classroom has dimensions of 32 feet (width) by 28 feet (length).

a. What are the dimensions of his scale drawing of the classroom?

$\frac{\frac{1}{2}in}{4ft} = \frac{1in}{8ft}$ $\quad \frac{1in}{8ft} = \frac{4in}{32ft}$ $\quad \frac{1in}{8ft} = \frac{x\ 3.5in}{28ft}$ $\quad$ 4in by 3.5in

b. The simplified unit ratio of **classroom length : drawing length**, written as a fraction, $\frac{classroom\ length}{drawing\ length}$, is the scale factor for lengths. What is it?

$\frac{28\ ft}{3.5\ in} = \frac{8ft}{1in}$

c. The simplified unit ratio of **classroom area : drawing area**, written as a fraction, $\frac{classroom\ area}{drawing\ area}$ is the scale factor for areas. What is it?

area: $\begin{array}{r} 32 \\ \times 28 \\ \hline 256 \\ 64 \\ \hline 896 \end{array}$ $\quad \frac{896\ ft^2}{14in^2}$ $\quad \begin{array}{r} 3.5 \\ \times\ 4 \\ \hline 14.0 \end{array}$ $\quad \frac{896ft^2}{14in^2} = \frac{64ft^2}{1in}$

d. What is the mathematical relationship between the scale factor for lengths and the scale factor for areas?

The relationship is what the scale factor is squared when we go to scale factor.

( )

Ted bought 4 cans of Soup A for $6.00.

For each soup in the table, indicate whether or not the soup has the same price per can as Soup A.

Drag and drop the appropriate phrase into each box.

Has the same price per can as Soup A	Does not have the same price per can as Soup A
Soup B: 2 cans for $5.00	Soup C: 3 cans for $4.50
Soup D: 5 cans for $5.50	Soup E: 6 cans for $9.00

Soup A: $\frac{\$6.00}{4} = \frac{\$1.50}{1\ can}$ $\quad$ Soup B: $\frac{\$5.00}{2} = \frac{\$2.50}{1}$ $\quad$ Soup C: $\frac{4.50}{3\ cans} = \frac{\$1.50}{1\ can}$ $\quad$ Soup D: $\frac{\$5.50}{5\ cans} = \frac{\$1.10}{1\ can}$ $\quad$ Soup E: $\frac{\$9.00}{6\ cans} = \frac{\$1.50}{1\ can}$