

Name Answer key

Date \_\_\_\_\_

### Lesson #51 – Identify Proportional and Non-Proportional Relationships in Equations

**Do Now:** Answer the following multiple choice question without using a calculator. Show all work

A) The label on a  $1\frac{1}{2}$ -pound bag of wildflower seeds states that it will cover an area of 375 square feet. Based on this information, what is the number of square feet that 1 pound of wildflower seeds will cover?

A  $\frac{1}{250}$

B 250

C  $562\frac{1}{2}$

D 750

$$\frac{\text{sq. ft}}{\text{lb}} \quad \frac{375}{1\frac{1}{2}} = \frac{375}{1.5}$$

$$\begin{array}{r} 250. \\ 1.5 \overline{) 375.0} \\ \underline{-30} \phantom{0} \\ 75 \\ \underline{-75} \\ 00 \end{array}$$

1) Your mother has accelerated onto the interstate beginning a long road trip, and you notice that the low fuel light is on, indicating that there is a half a gallon left in the gas tank. The nearest gas station is 26 miles away. Your mother keeps a log where she records the mileage and the number of gallons purchased each time she fills up the tank. Use the information in the table below to determine whether you will make it to the gas station before the gas runs out. You know that if you can determine the amount of gas that her car consumes in a particular number of miles, then you can determine whether or not you can make it to the next gas station.

Mother's Gas Record

Gallons	Miles Driven
8	224
10	280
4	112

28 mi for 1 gal

14 mi for  $\frac{1}{2}$  gal

\*you will run out of gas\*

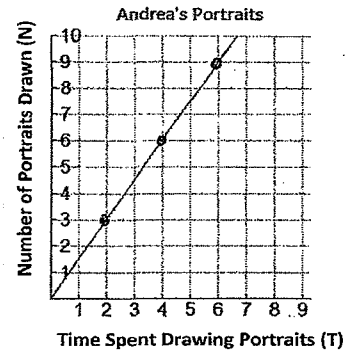
a. Find the constant of proportionality, and explain what it represents in this situation.

$$\frac{224}{8} = 28 \quad \frac{280}{10} = 28 \quad \frac{112}{4} = 28 \quad \boxed{28} \quad \text{28 miles driven on 1 gallon of gas.}$$

b. Write an equation that will relate the miles driven to the number of gallons of gas.

$$y = 28x$$

- 2) Andrea is a street artist in New York City. She draws caricatures (cartoon-like portraits) of tourists. People have their portrait drawn and then come back later to pick it up from her. The graph below shows the relationship between the number of portraits she draws and the amount of time in hours she needs to draw the portraits.



- a. Write three ordered pairs from the graph, and explain what each ordered pair means in the context of this graph.

(2, 3) In 2 hours, she can draw 3 portraits.

(4, 6) In 4 hours, she can draw 6 portraits.

(6, 9) In 6 hours, she can draw 9 portraits.

- b. Determine the constant of proportionality, and explain what it means in this situation.

$\frac{3}{2} = 1.5$  1.5 Andrea can draw 1.5 ~~hrs~~ portraits in a hour.

- c. Write an equation that would relate the number of portraits drawn to the time spent drawing the portraits.

$$y = 1.5x$$

**Directions:** Write an equation that will model the proportional relationship given in each real-world situation.

- 3) There are 3 cans that store 9 tennis balls. Consider the number of balls per can.

- a. Find the constant of proportionality for this situation.

$$\frac{9}{3} = 3$$

- b. Write an equation to represent the relationship.

$$y = 3x$$