

NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES

Unit Assessment

Assessment

Unit 1 Assessment

Circle the letter of the best answer.

- How many terms are in the simplified expression $22x^3 + 14x^2 - 10x^2 + 3x + 7$?
 - 5
 - 4
 - 3
 - 2
- The product of -3 , a , and b is represented by the expression $-3ab$. If the value of a is negative, what must be said about the value of b in order for the product to remain negative?
 - b must be 0.
 - b must be positive.
 - b must be negative.
 - The value of b does not matter.
- A family's cell phone plan costs \$70 per month for 1,300 minutes and 40 cents per minute over the limit. This month, the family paid \$118.40. By how much time did they exceed their plan?
 - 121 minutes
 - 471 minutes
 - 20 minutes
 - 76 minutes
- You have no more than \$60 to spend. You want a drink that costs \$1.50 including tax, and you want to buy a pair of pants, which will have 4% sales tax. What is the inequality that represents the amount of money you have to spend?
 - $x + 0.04x + 1.50 > 60$
 - $x + 0.04x + 1.50 \geq 60$
 - $x + 0.04x + 1.50 < 60$
 - $x + 0.04x + 1.50 \leq 60$
- A store has a display with pencils that are for sale. The owner typically sells 6 pencils a day. The display holds 50 pencils. The owner insists that there be no fewer than 32 pencils in the display. When should the owner restock the display?
 - in more than 3 days
 - in less than 3 days
 - in 3 days or less
 - in 3 days or more
- A type of bacteria doubles every 7 hours. If you started with 16 bacteria in a Petri dish, how many bacteria would you have after 56 hours?
 - 2,048 bacteria
 - 4,096 bacteria
 - $7.2 \cdot 10^{16}$ bacteria
 - $1.15 \cdot 10^{18}$ bacteria

continued

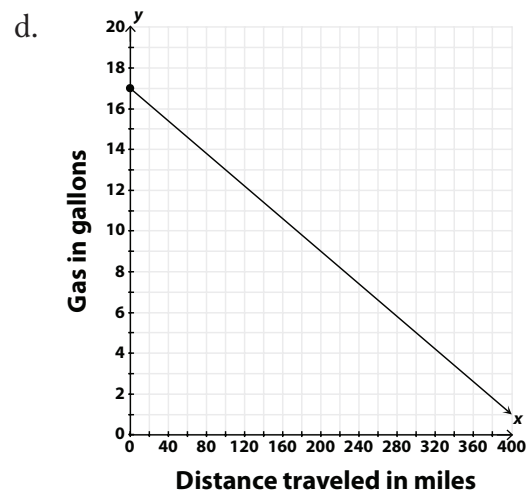
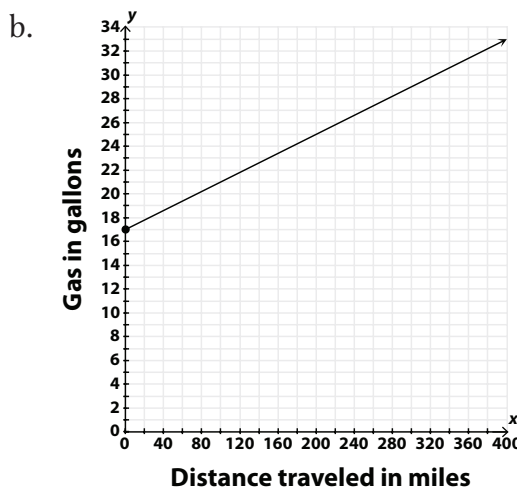
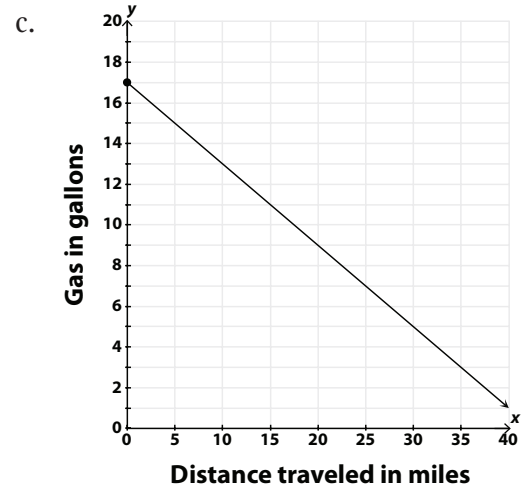
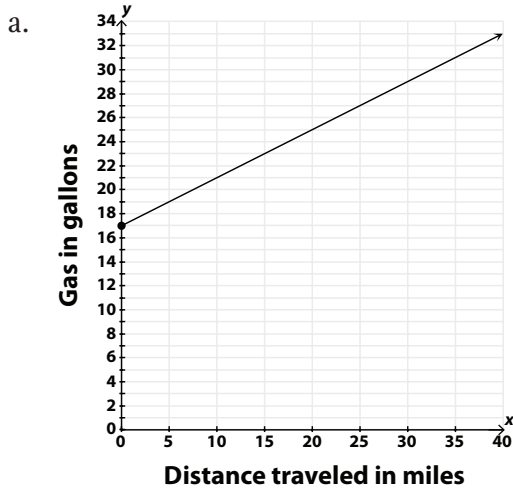
NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES

Unit Assessment

Assessment

9. A 4-door sedan holds 17 gallons of gas and the tank averages 0.04 gallons per mile. Which graph models the amount of gas left in the tank?



continued

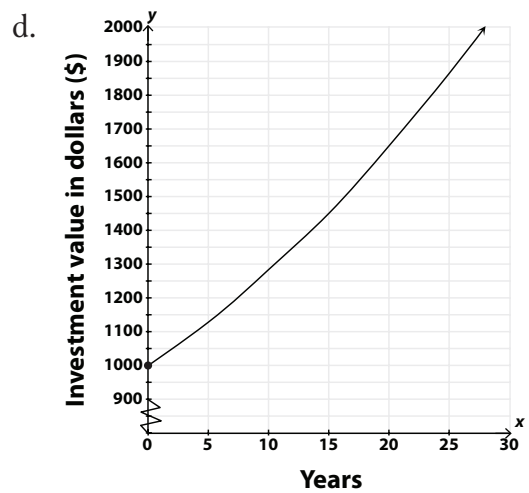
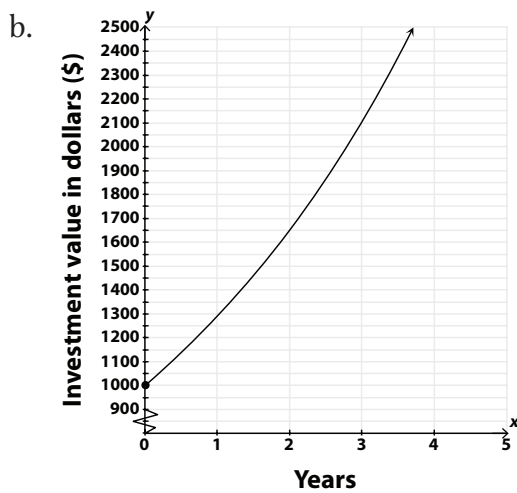
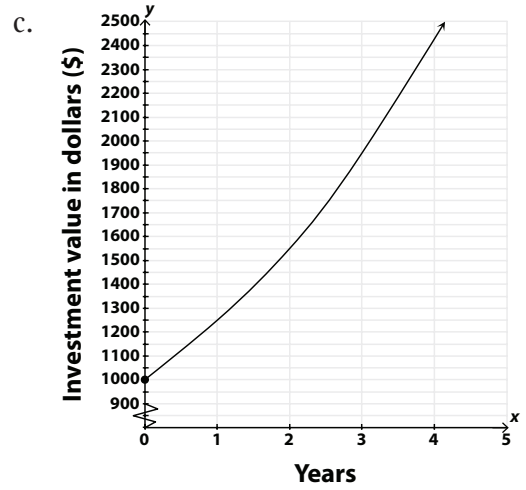
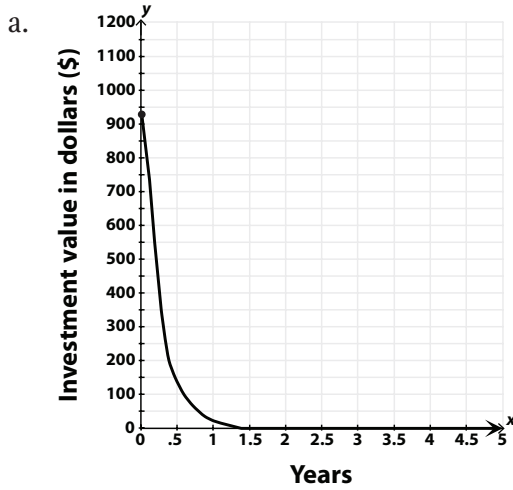
NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES

Unit Assessment

Assessment

10. An investment of \$1,000 is compounded monthly at a rate of 2.5%. Which graph models the change of the investment over time?



continued

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES**Unit Assessment****Assessment**

11. Your doctor told you to eat at least 70 milligrams of vitamin C each day. One tomato contains 16 milligrams of vitamin C, while one potato contains 17 milligrams. Determine which system of inequalities represents the number of tomatoes and potatoes you must eat in order to reach your minimum recommended amount of vitamin C.

a.
$$\begin{cases} 16x + 17y \leq 70 \\ x \leq 0 \\ y \leq 0 \end{cases}$$

c.
$$\begin{cases} 16x + 17y \geq 70 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

b.
$$\begin{cases} 16x + 17y \leq 70 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

d.
$$\begin{cases} 16x + 17y \geq 70 \\ x \leq 0 \\ y \leq 0 \end{cases}$$

12. The formula for calculating a person's body mass index is $B = \frac{w}{h^2}$, for which w represents weight in kilograms and h represents height in meters. Solve this formula for w .

a. $w = Bh^2$

c. $w = \frac{B}{h^2}$

b. $w = B - h^2$

d. $w = (Bh)^2$

Read each scenario and answer the questions that follow. Write your answers below each lettered part and show your work in the space provided.

13. Keisha bought 6 tickets to an indoor water park. She paid a 5% service charge for buying them online. Her total cost was \$252.
- What equation can be used to model the total cost of the tickets?
 - What was the price of each ticket?
 - How much did Keisha pay in service charges?

continued

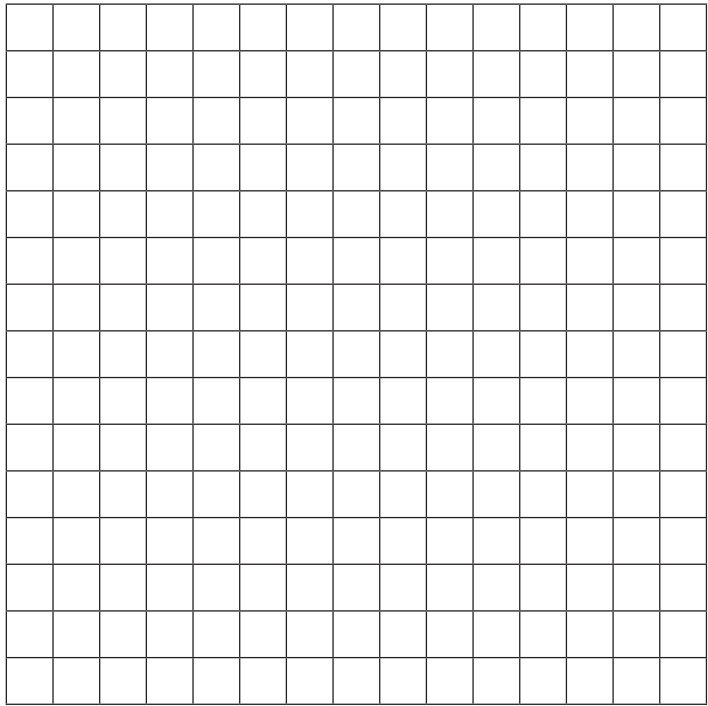
NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES
Unit Assessment

Assessment

14. Min-Ji injured her elbow during a varsity volleyball game. Her doctor has recommended physical therapy several times a week. Min-Ji’s parents want to plan for the potential cost of therapy over the course of a month. They pay \$160 a month for insurance and then another \$20 fee each time Min-Ji goes to physical therapy.
- a. What equation models the total fees for physical therapy?

 - b. What does the graph of the equation look like? Graph the equation below. Be sure to label the axes.



continued

NAME: _____

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES

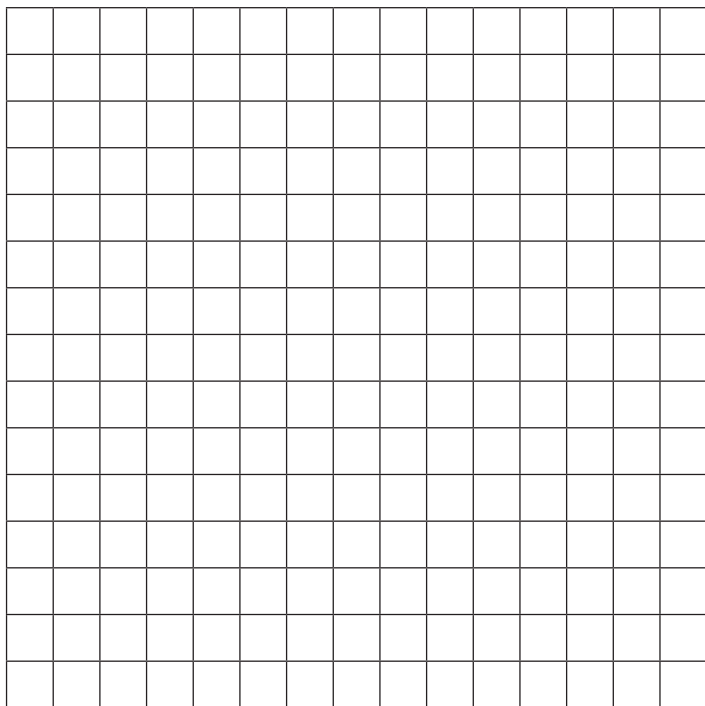
Unit Assessment

Assessment

15. The population of Georgia is growing at a yearly rate of about 1.3%. The current population is about 9,815,210 people. The population of North Carolina is growing at a yearly rate of about 1.25%. North Carolina's current population is about 9,656,401 people.
- a. What is the equation that models Georgia's population growth?

 - b. What is the equation that models North Carolina's population growth?

 - c. What do the graphs of the equations look like? Graph the equations below. Be sure to label the axes.



- d. Write a few sentences comparing the population models of Georgia and North Carolina. What can you conclude based on your models?