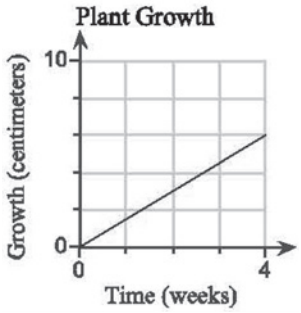
Name _____ Class _____ Date _____

Practice 5-4

Unit Rates and Slope

1. The graph shows the number of centimeters a particular plant grows over time. Given the points (0,0) and (4,6), how many centimeters does the plant grow per week?



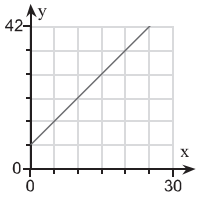
2. The graph shows the relationship between time and the number of soda bottles a machine can make. Use the points (2,50) and (6,150) to find the number of soda bottles the machine can make each minute.

3. The points (15,21) and (25,35) form a proportional relationship.

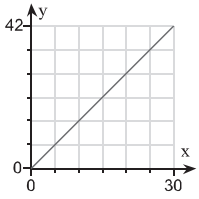
a) Find the slope of the line through the points.

b) Which graph represents this relationship?

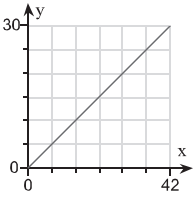
❍ A.



❍ B.



❍ C.

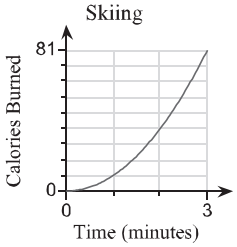


4. Your neighbor burns 117 Calories in 13 minutes cross-country skiing. There is a proportional relationship between Calories burned and time.

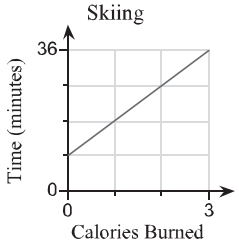
a) Find the unit rate.

b) Which graph represents the relationship between time and Calories burned?

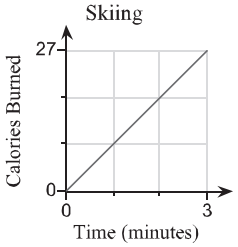
❍ A.



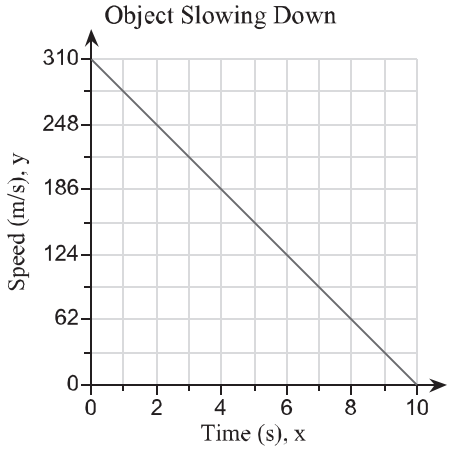
❍ B.



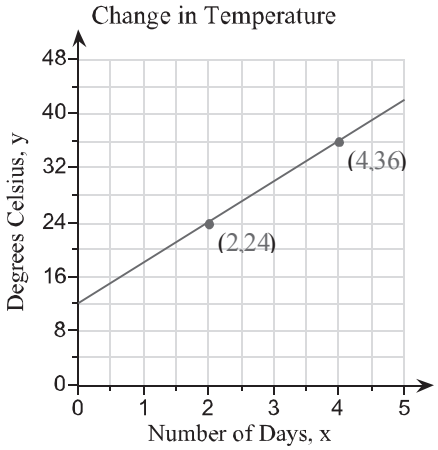
❍ C.



5. The graph represents an object slowing to a stop. Find two points on the line and use them to find the slope of the line.

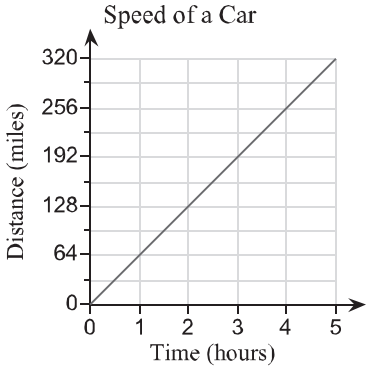


6. The graph shows the relationship between temperature and time for a scientific experiment where an object is heated. At what rate is the object heated?



7. Error Analysis A question on a test asks students to find the speed at which a car travels. The graph shows a proportional relationship between the distance traveled in miles and time in hours. Anna incorrectly says that the speed of the car is $\frac{1}{64}$ mile per hour.

a) What is the speed of the car?

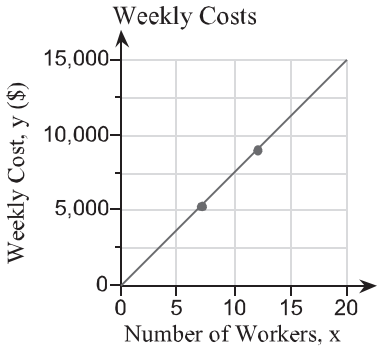


b) What error might Anna have made?

❍ A. She used $\frac{\text{change in y-coordinates}}{\text{change in x-coordinates}}$ to find a unit rate, not $\frac{\text{change in x-coordinates}}{\text{change in y-coordinates}}$.

❍ B. She used $\frac{\text{change in x-coordinates}}{\text{change in y-coordinates}}$ to find a unit rate, not $\frac{\text{change in y-coordinates}}{\text{change in x-coordinates}}$.

8. Writing The graph shows a proportional relationship between the number of workers and weekly cost in dollars for a company.



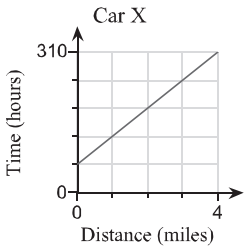
a) Use the points (7,5250) and (12,9000) to find the weekly cost for the company for each worker.

b) Describe what a unit rate is used for.

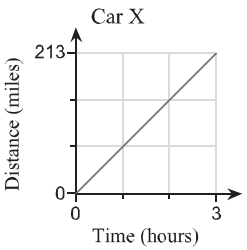
9. Reasoning Assume that Car X and Car Y are both traveling at constant speeds. Car X has traveled 186 miles in 3 hours. Car Y has traveled 142 miles in 2 hours.

a) Which graph represents the relationship between distance and time for Car X?

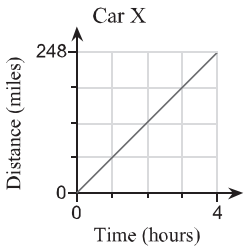
❍ A.



❍ B.

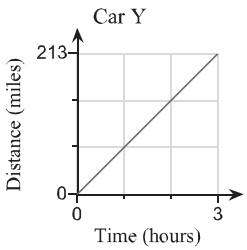


❍ C.

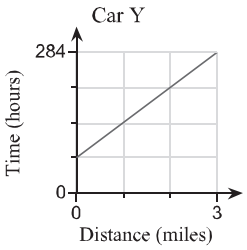


b) Which graph represents the relationship between distance and time for Car Y?

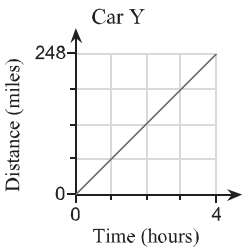
❍ A.



❍ B.



❍ C.

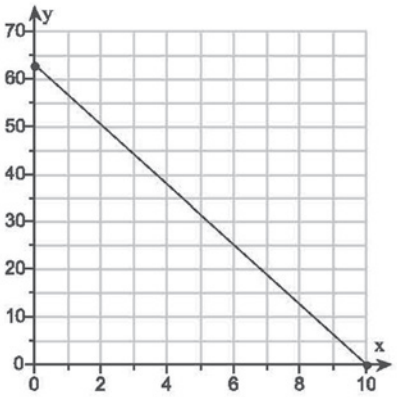


c) Explain your reasoning.

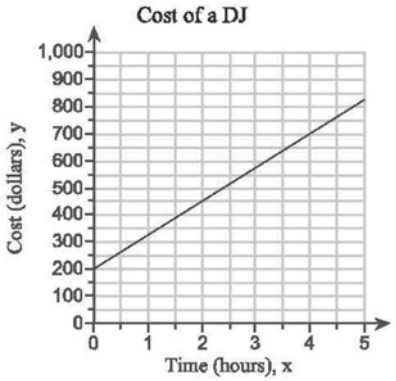
10. Open-Ended The graph shows a relationship that is not proportional.

a) Use the points (0,63) and (10,0) to find the slope.

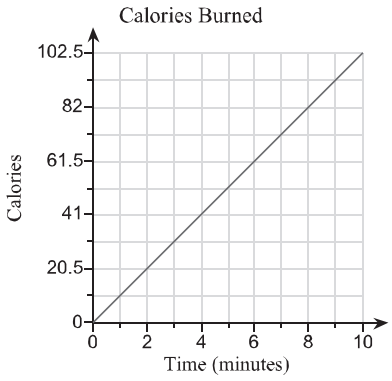
b) Describe a situation this graph could model.



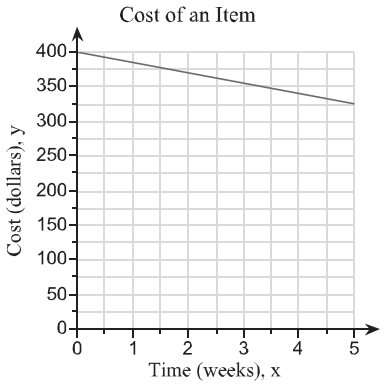
11. Entertainment You need to hire a DJ for a party. The DJ charges an initial fee plus an hourly rate. The graph shows the relationship between cost and time. What is the DJ's hourly rate?



12. The graph shows the number of Calories burned running. How many Calories do you burn per minute?



13. At a discount store, items are discounted by the same amount each week. The graph shows the relationship between time and cost of an item with an original cost of $400. At what rate is the item discounted each week?



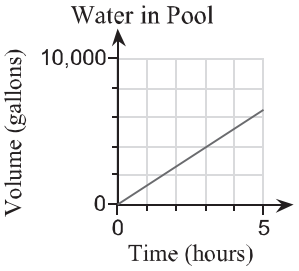
14. Think About the Process At the beginning of summer, a maintenance crew refills the swimming pool at a city park. The relationship between time and the amount of water in the pool is proportional. After 4 hours, the pool holds 5,200 gallons of water.

a) How could you graph this relationship?

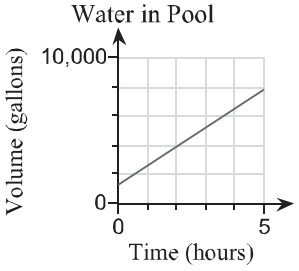
- ❍ A. Use the points (0,0) and (4,5200) to find the slope. Then start at (0,4), and use the slope to find the next point on the line.
- ❍ B. Use the points (0,4) and (5200,0) to find the slope. Then start at (0,4), and use the slope to find the next point on the line.
- ❍ C. Use the points (0,0) and (4,5200) to find the slope. Then start at (0,0), and use the slope to find the next point on the line.
- ❍ D. Use the points (0,4) and (5200,0) to find the slope. Then start at (0,0), and use the slope to find the next point on the line.

b) Which graph represents the relationship between time and the volume of water in the pool?

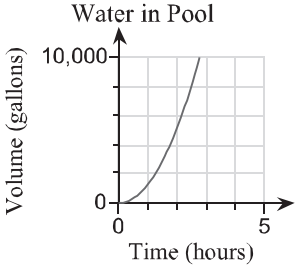
❍ A.



❍ C.



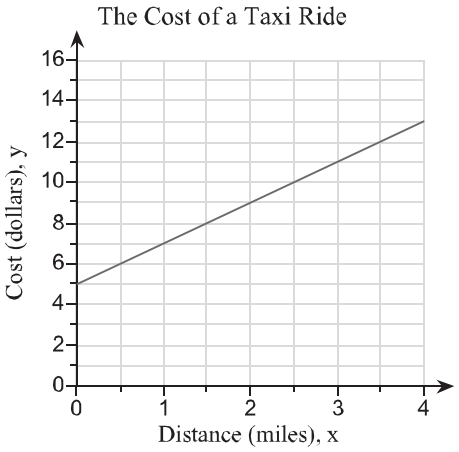
❍ B.



15. Think About the Process The graph shows the relationship between the cost in dollars of the taxi ride and the distance in miles the taxi travels.

a) How can you find the slope of the line?

b) What is the slope?



*Practice 5-4: **Unit Rates and Slope***

1. 1.5 cm/wk

2. 25

3. a) $\frac{7}{5}$

b) B

4. a) 9 cal/min

b) C

5. The points (10, 0) and (7, 93) are on the line.
The slope of the line is –31.

6. 6°C/day

7. a) 64 mph

b) B

8. a) $750

b) A unit rate compares a quantity to its unit of measure. Finding the cost of one unit makes it easy to find the cost of multiple units. A unit rate can be used to compare prices or calculate expenses.

9. a) C

b) A

c) Answers will vary

10. a) –6.3

b) Answers will vary

11. $125

12. 10.25

13. $15

14. a) C

b) A

15. a) Since the relationship is not proportional, use any two points on the line to find the slope.

b) 2