

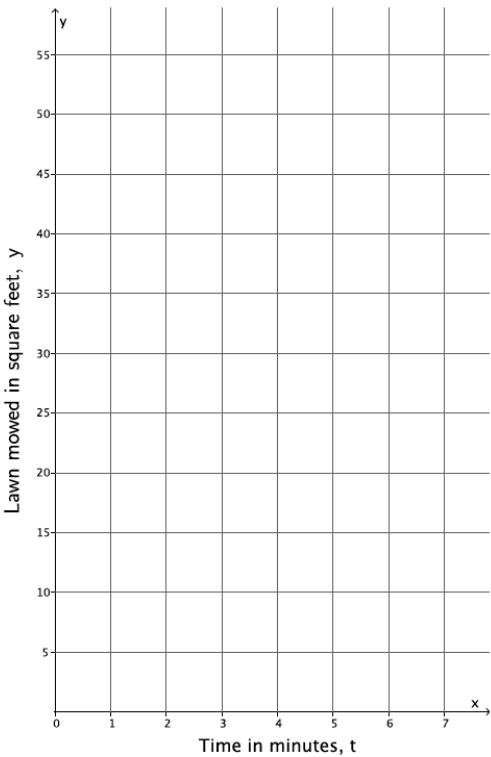
Lesson 11: Constant Rate

Classwork

Example 1

Pauline mows a lawn at a constant rate. Suppose she mows a 35 square foot lawn in 2.5 minutes. What area, in square feet, can she mow in 10 minutes?  $t$  minutes?

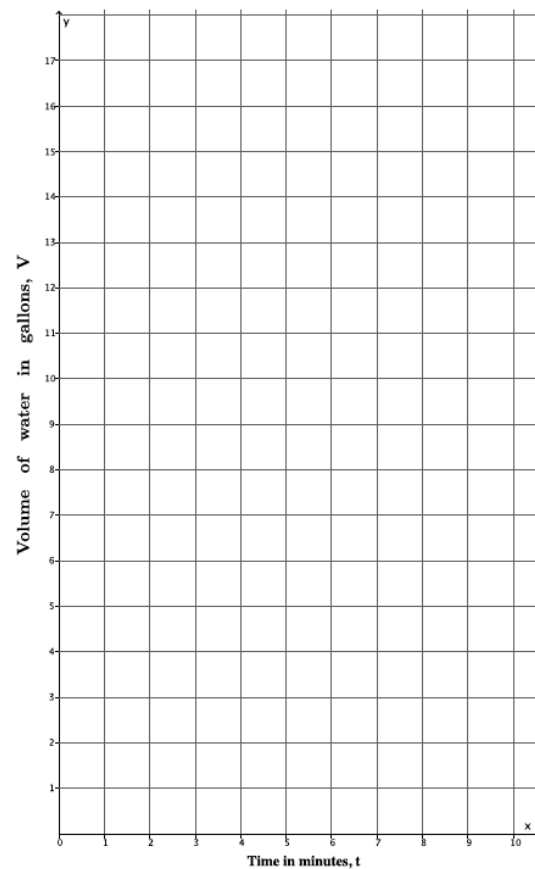
$t$ (time in minutes)	Linear equation:	$y$ (area in square feet)



**Example 2**

Water flows at a constant rate out of a faucet. Suppose the volume of water that comes out in three minutes is 10.5 gallons. How many gallons of water comes out of the faucet in  $t$  minutes?

$t$ (time in minutes)	Linear equation:	$V$ (in gallons)
0		
1		
2		
3		
4		

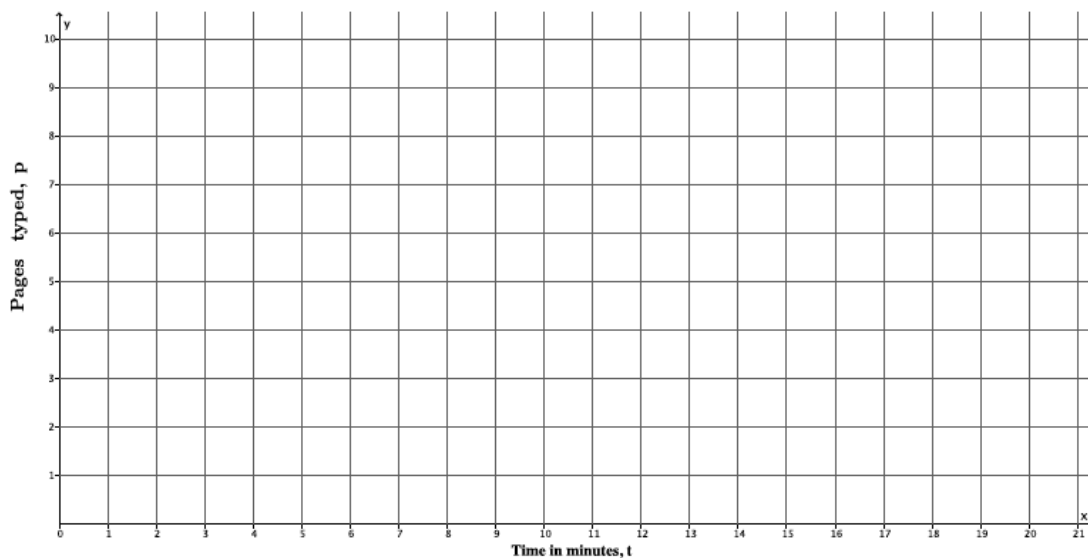


## Exercises

1. Juan types at a constant rate. He can type a full page of text in  $3\frac{1}{2}$  minutes. We want to know how many pages,  $p$ , Juan can type after  $t$  minutes.
  - a. Write the linear equation in two variables that represents the number of pages Juan types in any given time interval.
  - b. Complete the table below. Use a calculator and round your answers to the tenths place.

$t$ (time in minutes)	Linear equation:	$p$ (pages typed)
0		
5		
10		
15		
20		

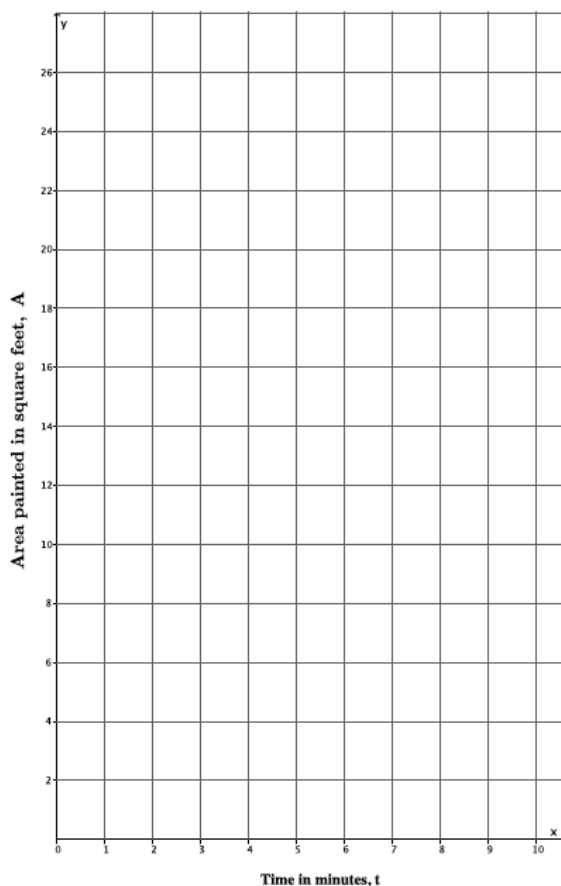
- c. Graph the data on a coordinate plane.



- d. About how long would it take Juan to type a 5-page paper? Explain.
2. Emily paints at a constant rate. She can paint 32 square feet in 5 minutes. What area,  $A$ , in square feet, can she paint in  $t$  minutes?
- a. Write the linear equation in two variables that represents the number of square feet Emily can paint in any given time interval.
- b. Complete the table below. Use a calculator and round answers to the tenths place.

$t$ (time in minutes)	Linear equation:	$A$ (area painted in square feet)
0		
1		
2		
3		
4		

- c. Graph the data on a coordinate plane.



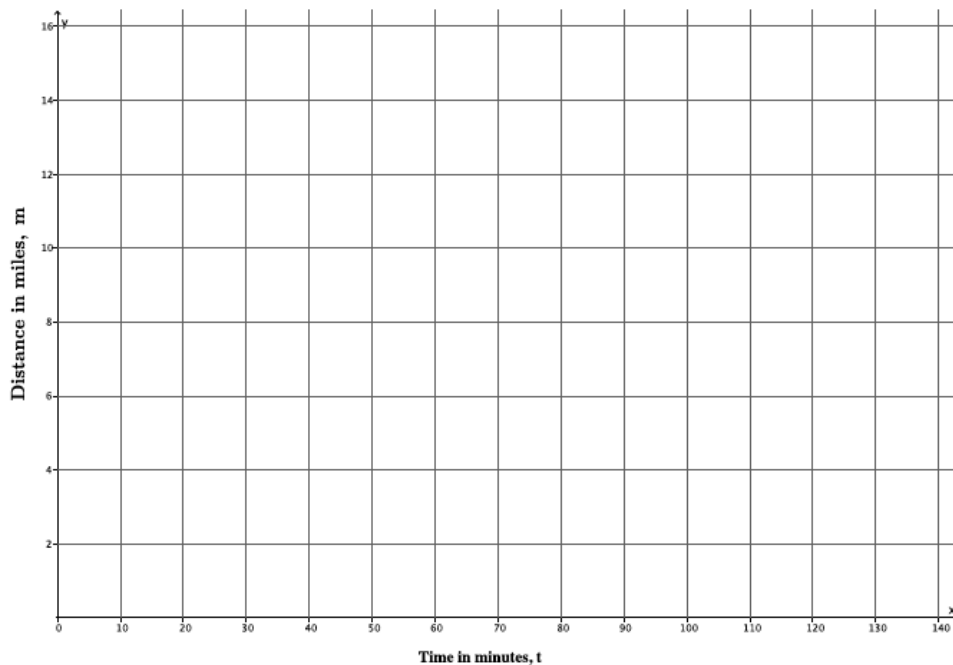
- d. About how many square feet can Emily paint in  $2\frac{1}{2}$  minutes? Explain.

3. Joseph walks at a constant speed. He walked to a store that is one-half mile away in 6 minutes. How many miles,  $m$ , can he walk in  $t$  minutes?
- a. Write the linear equation in two variables that represents the number of miles Joseph can walk in any given time interval,  $t$ .

- b. Complete the table below. Use a calculator and round answers to the tenths place.

$t$ (time in minutes)	Linear equation:	$m$ (distance in miles)
0		
30		
60		
90		
120		

- c. Graph the data on a coordinate plane.



- d. Joseph's friend lives 4 miles away from him. About how long would it take Joseph to walk to his friend's house? Explain.

### Lesson Summary

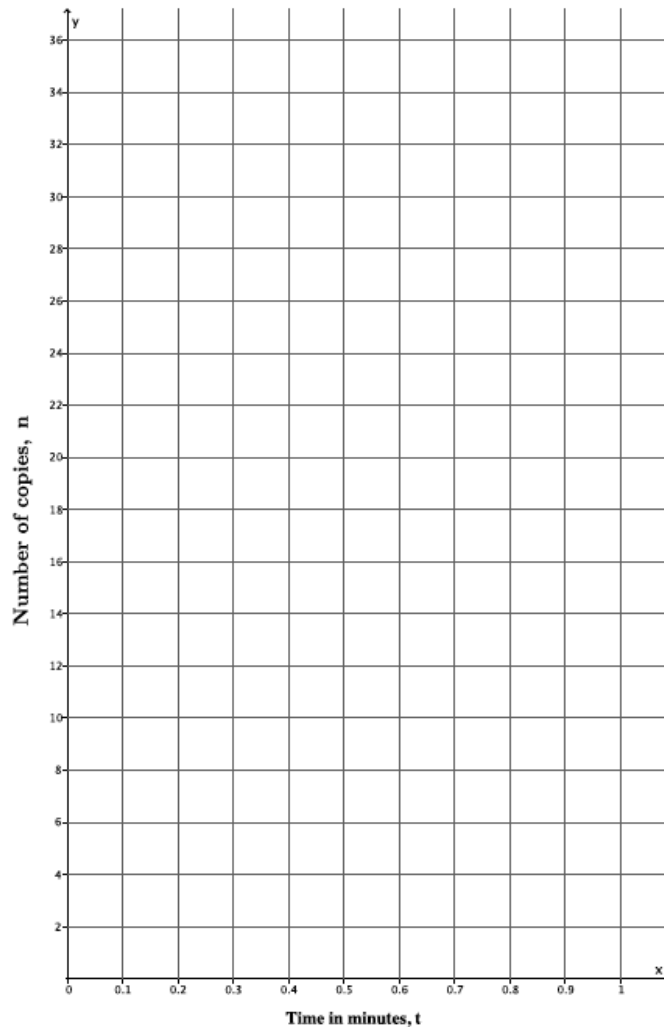
When constant rate is stated for a given problem, you can express the situation as a two-variable equation. The equation can be used to complete a table of values that can then be graphed on a coordinate plane.

### Problem Set

- A train travels at a constant rate of 45 miles per hour.
  - What is the distance,  $d$ , in miles, that the train travels in  $t$  hours?
  - How many miles will it travel in 2.5 hours?
- Water is leaking from a faucet at a constant rate of  $\frac{1}{3}$  gallons per minute.
  - What is the amount of water,  $w$ , in gallons per minute, that is leaked from the faucet after  $t$  minutes?
  - How much water is leaked after an hour?
- A car can be assembled on an assembly line in 6 hours. Assume that the cars are assembled at a constant rate.
  - How many cars,  $y$ , can be assembled in  $t$  hours?
  - How many cars can be assembled in a week?
- A copy machine makes copies at a constant rate. The machine can make 80 copies in  $2\frac{1}{2}$  minutes.
  - Write an equation to represent the number of copies,  $n$ , that can be made over any time interval,  $t$ .
  - Complete the table below.

$t$ (time in minutes)	Linear equation:	$n$ (number of copies)
0		
0.25		
0.5		
0.75		
1		

- c. Graph the data on a coordinate plane.



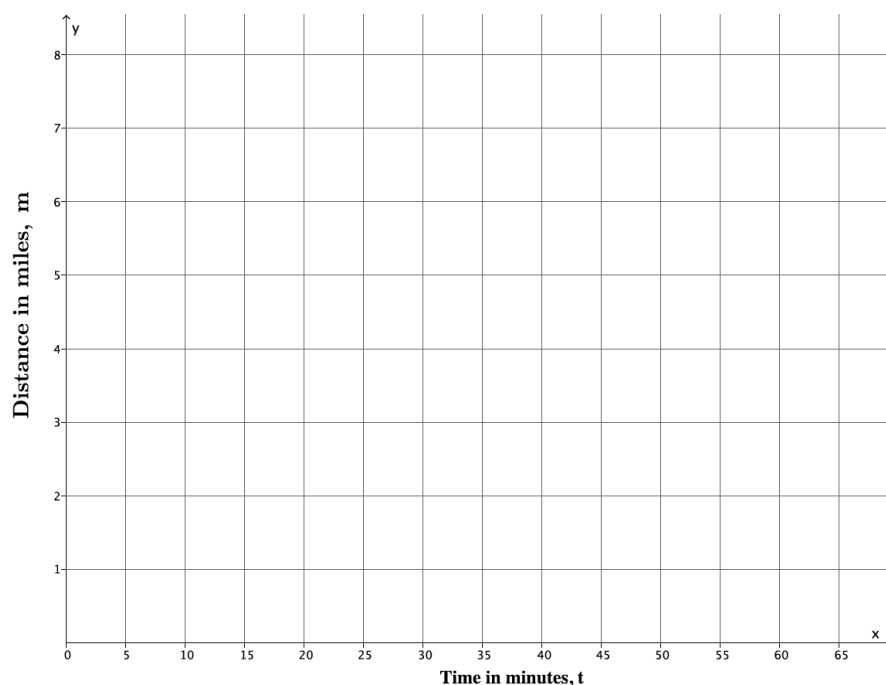
- d. The copy machine runs for 20 seconds, then jams. About how many copies were made before the jam occurred? Explain.



5. Connor runs at a constant rate. It takes him 34 minutes to run 4 miles.
- Write the linear equation in two variables that represents the number of miles Connor can run in any given time interval,  $t$ .
  - Complete the table below. Use a calculator and round answers to the tenths place.

$t$ (time in minutes)	Linear equation:	$m$ (distance in miles)
0		
15		
30		
45		
60		

- Graph the data on a coordinate plane.



- Connor ran for 40 minutes before tripping and spraining his ankle. About how many miles did he run before he had to stop? Explain.