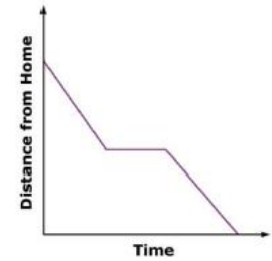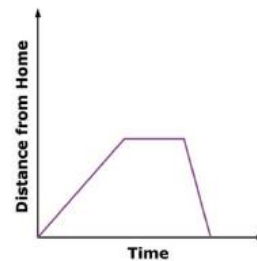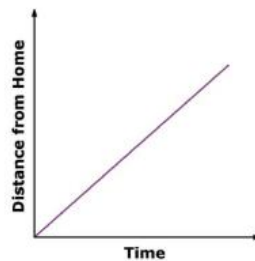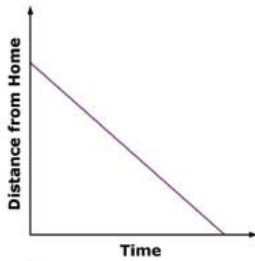1. Each day, Maria walks from home to school and then from school to home. The graphs below show the distance that Maria is from home at different times during her walk. Match the descriptions that follow to a graph.

A. Maria walks from school to her friend's house. She visits her friend for a while. Then she walks the rest of the way home.

B. Maria walks from home to school at a constant rate.

D. Maria walks from school to home at a constant rate.

C. Maria starts to walk from home to school. She stops to see whether she has her homework. She realizes she forgot her homework and runs back home to get it.

2. The total cost of an order of shirts from a company consists of the cost of each shirt plus a one-time design fee. The cost of each shirt is the same regardless of how many shirts are ordered. The company provides the following examples to customers to help them estimate the total cost of an order of shirts:
   - 50 shirts cost $349.50
   - 500 shirts cost $2370

a. Based on the examples above, what is the cost of each shirt, not including the one-tome design fee? Explain how you found your answer.

b. What is the cost of the one-time design fee?

3. Consider the equation $3(2x + 5) = ax + b$
   a. Find one value for a and one value for b so there is exactly one value of x that makes the equation true.

   b. Find one value for a and one value for b so there are infinitely many values of x that make the equation true.

4. The table below shows the horsepower and top speed of 12 cars.

Horsepower	Top Speed (miles per hour)
165	122
150	117
90	109
49	96
70	105
62	98
245	148
140	114
103	112
180	133
130	115
145	120

a. Construct a scatterplot of the data.

Horsepower and Top Speed of 12 Cars
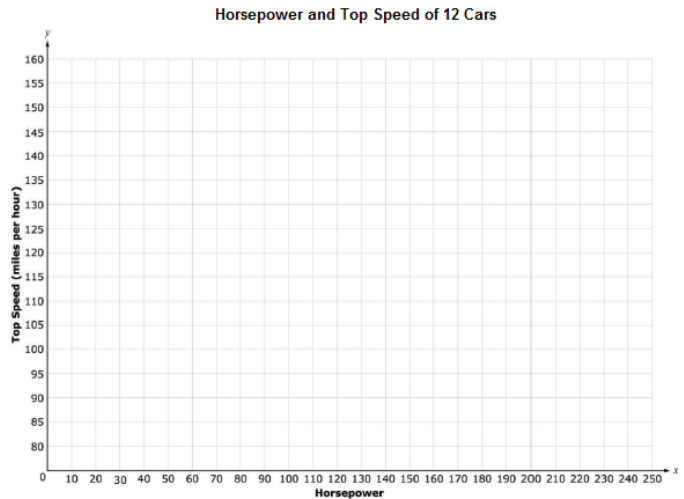
b. draw a line of best fit on your scatterplot.

c. Based on the graph you drew, how much more horsepower is needed to increase the top speed of a car by 5 mph? Explain how you found your answer.

5. Samir was assigned to write an example of a linear function. He wrote this example for the assignment:

The relationship between the year and the population of a county when the population increases by 10% each year

a. Complete the table below to create an example of the population of a certain county that is increasing by 10% each year.

b. State whether Samir's example represents a linear functional relationship. Explain your reasoning.

Year	Population of a Certain County
0	
1	
2	
3	
4	

6. Complete the picture below with whole numbers from 1 to 9 to find the following:

$$\Box \, X + \Box = \Box$$

a. Make x the greatest value possible

b. Make x the least value possible

c. Make x the closest value to zero as possible

1. Mr. Perry's students used pairs of points to find the slopes of lines. Mr. Perry asked Avery how she used the pairs of points listed in this table to find the slope of a line:

x	y
8	18
20	45

Avery said, "The easiest way to find slope is to divide y by x. The slope of this line is $\frac{18}{8}$ or $\frac{9}{4}$.

  a. Show another way to find the slope of the line that passes through the points listed in the table. Your method must be different from Avery's method.

  b. Write an example that shows that Avery's "divide y by x" method will not work to find the slope of any line.

2. Three students solved the equation $3(5x - 14) = 18$ in different ways, but each student arrived at the correct answer. Select all of the solutions that show a correct method for solving the equation.

Ⓐ
$$3(5x - 14) = 18$$
$$8x - 14 = \ 18$$
$$\underline{+14 \quad +14}$$
$$\frac{8x}{8} = \frac{32}{8}$$
$$x = 4$$

Ⓑ
$$\frac{1}{\cancel{3}} \cdot \cancel{3}(5x - 14) = 18 \cdot \frac{1}{3}$$
$$5x - 14 = \ 6$$
$$\underline{+14 \quad +14}$$
$$\frac{5x}{5} = \frac{20}{5}$$
$$x = 4$$

Ⓒ
$$3(5x - 14) = 18$$
$$\frac{15x}{15} - \frac{42}{15} = \frac{18}{15}$$
$$+ \frac{42}{15} \quad + \frac{42}{15}$$
$$x = \frac{60}{15}$$
$$x = 4$$

3. For each linear equation in the table below, indicate whether the equation has no solution, one solution, or infinitely many solutions.

Equation	No Solution	One Solution	Infinitely Many Solutions
7x + 21 = 21			
12x + 15 = 12x − 15			
−5x − 25 = 5x + 25			

4. The graphs of line a and line b are shown on the coordinate grid below. What is the equation for line a? What is the equation for line b?
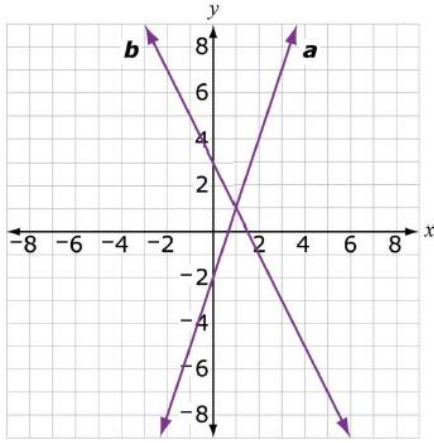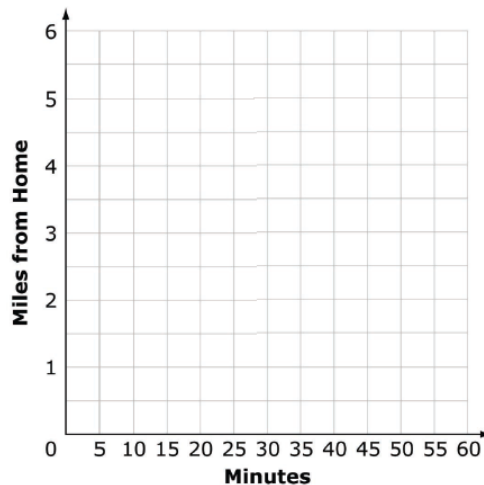

5. The solution of a system of two linear equations is (-3,1). On the coordinate grid below, graph two lines that could be the graphs of the two linear equations in the system. Write the equation for each of your lines.
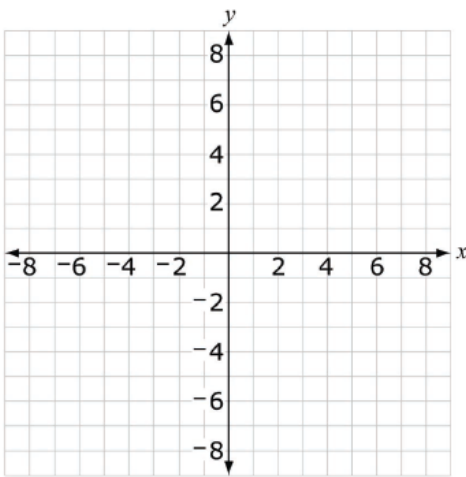

6. Carla rode her bike to her grandmother's house. The following information describes her trip:
   - For the first five minutes, Carla rode fast and then slowed down. She rode 1 mile.
   - For the next 15 minutes, Carla rode at a steady pace until she arrived at her grandmother's house. She rode 3 miles.
   - For the next 10 minutes, Carla visited her grandmother.
   - For the next 5 minutes, Carla rode slowly at first but then began to ride faster. She rode 1 mile.
   - For the last 10 minutes, Carla rode fast. She rode 3 miles at a steady pace.

   Graph each part of Carla's trip on the coordinate plane below.

7. Line a is shown on the coordinate grid below. Construct line b on the same coordinate grid so that:
- Line a and line b represent a system of linear equations with a solution of (7,-2)
- The slope of line b is greater than -1 and less than 0
- The y-intercept of line b is positive
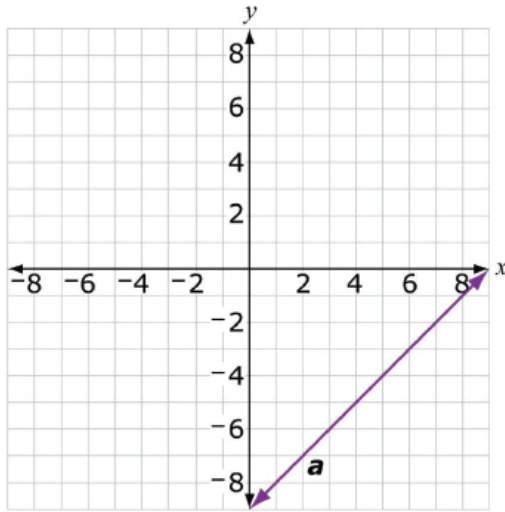
8. Three students saved money for 4 weeks.

Antwan saved the same amount of money each week for 4 weeks. He made the graph below to show how much money he saved:
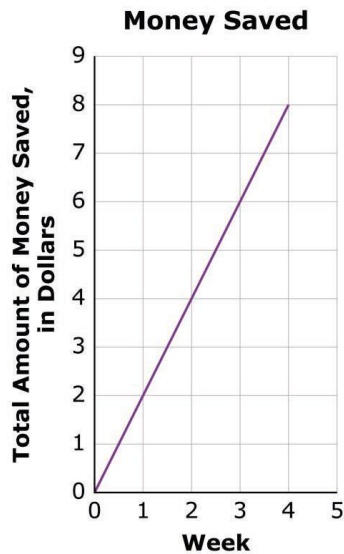
Money Saved

Carla saved the same amount of money each week for 4 weeks. She made the table below to show how much money she saved:

Week	Total Amount of Money Saved
1	$1.75
2	$3.50
3	$5.25
4	$7.00

Omar saved the same amount of money each week for 4 weeks. He wrote the equation, $s = 2.5\,w$ to show how much he saved, where s represents money saved and w represents weeks.

a. Which student saved the greatest amount of money each week?

b. Which student saved the least amount of money each week?

1. Juan needs a right cylindrical storage tank that holds between 110 and 115 cubic feet of water. Using whole numbers only, provide the radius and height for 3 different tanks that hold between 110 and 115 cubic feet of water.

Tank #1	Tank #2	Tank #3
radius = ☐ ft.	radius = ☐ ft.	radius = ☐ ft.
height = ☐ ft.	height = ☐ ft.	height = ☐ ft.

2. Joe solved the following linear system:

$$6x + 3y = 6$$
$$y = -2x + 2$$

These are the last two steps of his work: $6x - 6x + 6 = 6$
$$6 = 6$$

Which statement about this linear system must be true?

    A. x must equal 6   C. There is no solution to this system

    B. y must equal 6   D. There are infinitely many solutions to this system.

3. Fill in the boxes with a whole number between 0 and 9 to create the following equations.

    a. Equation with no solution: $8x - 3x + 2 - x = \boxed{}x + \boxed{}$

    b. Equation with one solution: $8x - 3x + 2 - x = \boxed{}x + \boxed{}$

    c. Equation with infinitely many solutions: $8x - 3x + 2 - x = \boxed{}x + \boxed{}$

4. A sphere and a cone have the same volume. Each figure has a radius of 3 inches. What is the height of the cone?
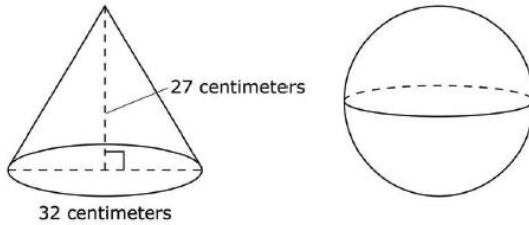
5. John and Kim wrote down two different functions that have the same rate of change. John's function is represented by the table below:

| x	y
-1	-5
1	-1
3	3

Graph a function that could be Kim's on the coordinate plane below.
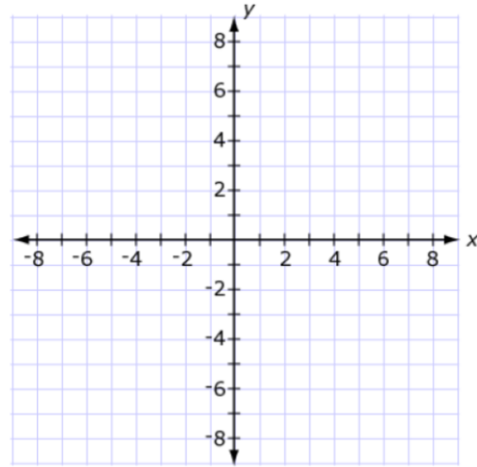
6. The cone and sphere shown below have equal volumes. What is the radius of the sphere?

27 centimeters

32 centimeters

7. A coffee shop charges $2.00 per pound of coffee. Draw a line on the coordinate plan below that shows the proportional relationship between the number of pounds of coffee purchased and the total cost.

Coffee Cost

Cost ($)

Pounds of Coffee
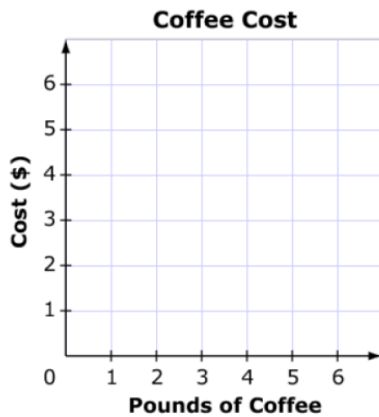
8. Graph $\frac{\sqrt{4}}{5}$ and $\frac{\pi}{5}$ and $\frac{3}{10}$ on the number line below:

0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8