

Math 9 Adapted LG 9
Linear Equations – Creating a Table of Values

Linear relations have two different variables (such as y & x). We can determine the value of y if we know different values of x .

Example: $y = 5x + 2$

Let's solve for y based on different values of x .

$$\begin{aligned}\text{If } x = 0 & \rightarrow y = 5(0) + 2 \\ & y = 0 + 2 \\ & y = 2\end{aligned}$$

$$\begin{aligned}\text{If } x = 1 & \rightarrow y = 5(1) + 2 \\ & y = 5 + 2 \\ & y = 7\end{aligned}$$

$$\begin{aligned}\text{If } x = 2 & \rightarrow y = 5(2) + 2 \\ & y = 10 + 2 \\ & y = 12\end{aligned}$$

We can put this information into a table.



Finish the table by determining the value of y when x is 3 and 4. Show your work below:

x	y
0	2
1	7
2	12
3	
4	

Complete the table of values below for each relation. Show your work.

$$y = x + 2$$

x	y
0	
1	
2	
3	
4	

$$y = 6x + 9$$

x	y
-2	
-1	
0	
1	
2	

$$y = \frac{x}{2} + 1$$

x	y
-4	
-2	
0	
2	
4	

$$y = 2x + 10$$

x	y
-2	
-1	
0	
1	
2	

1) $y = -5x - 3$

x	y
-1	
5	
-8	
-5	
-4	

5) $y = -4x$

x	y
8	
6	
0	
-3	
-9	

9) $y = 4x$

x	y
-2	
-1	
6	
-5	
4	

2) $y = x + 4$

x	y
0	
-1	
6	
-7	
7	

6) $y = x - 8$

x	y
-5	
8	
3	
-6	
4	

10) $y = x + 7$

x	y
-3	
4	
3	
9	
-1	

3) $y = -2x - 7$

x	y
3	
-4	
-9	
-3	
6	

7) $y = -3x$

x	y
4	
-1	
8	
-3	
6	

11) $y = -9x$

x	y
5	
2	
-7	
-6	
9	

4) $y = x - 6$

x	y
-7	
4	
5	
-5	
0	

8) $y = 3x - 5$

x	y
-9	
7	
0	
5	
-6	

1) $y = -5x - 3$

x	y
-1	2
5	-28
-8	37
-5	22
-4	17

5) $y = -4x$

x	y
8	-32
6	-24
0	0
-3	12
-9	36

9) $y = 4x$

x	y
-2	-8
-1	-4
6	24
-5	-20
4	16

2) $y = x + 4$

x	y
0	4
-1	3
6	10
-7	-3
7	11

6) $y = x - 8$

x	y
-5	-13
8	0
3	-5
-6	-14
4	-4

10) $y = x + 7$

x	y
-3	4
4	11
3	10
9	16
-1	6

3) $y = -2x - 7$

x	y
3	-13
-4	1
-9	11
-3	-1
6	-19

7) $y = -3x$

x	y
4	-12
-1	3
8	-24
-3	9
6	-18

11) $y = -9x$

x	y
5	-45
2	-18
-7	63
-6	54
9	-81

4) $y = x - 6$

x	y
-7	-13
4	-2
5	-1
-5	-11
0	-6

8) $y = 3x - 5$

x	y
-9	-32
7	16
0	-5
5	10
-6	-23

12) $y = 7x + 9$

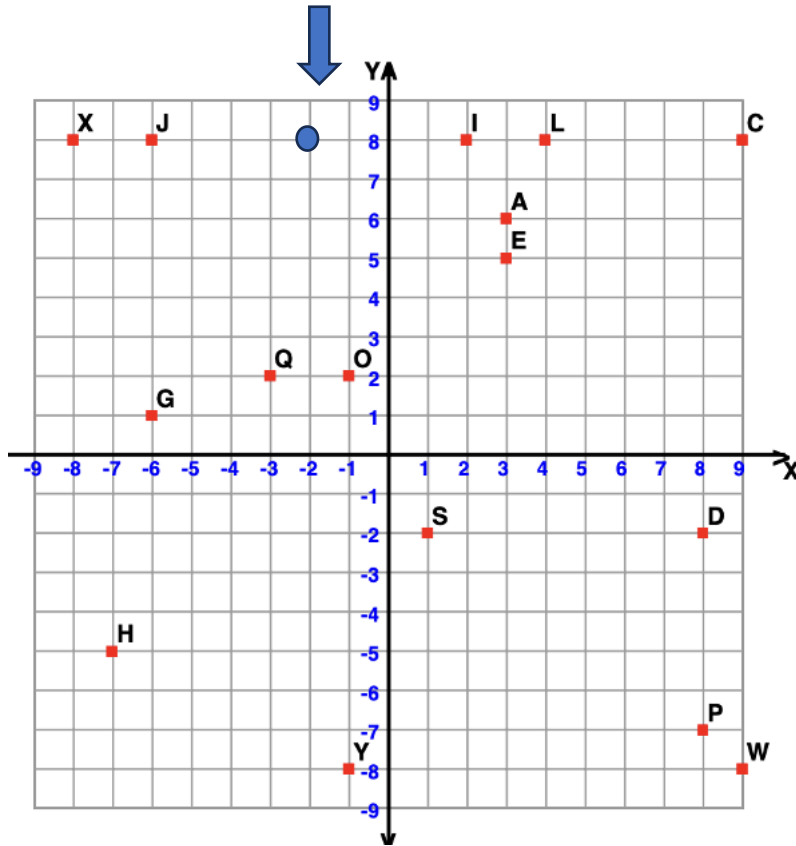
x	y
0	9
2	23
-2	-5
6	51
8	65

Check your work here...

Identifying coordinates on a graph.

Points can be identified on graph by seeing where the point lines up with the x (horizontal) and y (vertical) axis.

Ex. this point lines up with -2 on the x axis & 8 on the y axis.



We can write each point as an ordered pair.

(X -coordinate, y-coordinate)

$(-2, 8)$

Tell what point is located at each ordered pair.

- | | | | |
|---------------------|---------------------|---------------------|---------------------|
| 1) $(+1, -2)$ _____ | 3) $(+4, +8)$ _____ | 5) $(+8, -2)$ _____ | 7) $(-1, +2)$ _____ |
| 2) $(+3, +6)$ _____ | 4) $(-1, -8)$ _____ | 6) $(-3, +2)$ _____ | 8) $(-6, +8)$ _____ |

Write the ordered pair for each given point.

- | | | | |
|-------------|-------------|-------------|-------------|
| 9) I _____ | 11) E _____ | 13) C _____ | 15) X _____ |
| 10) H _____ | 12) W _____ | 14) G _____ | 16) P _____ |

Plot the following points on the coordinate grid.

- | | | | |
|------------------|------------------|------------------|------------------|
| 17) T $(+8, -5)$ | 19) K $(+2, +2)$ | 21) Z $(-9, -4)$ | 23) U $(-8, +2)$ |
| 18) B $(+4, +7)$ | 20) M $(-8, -3)$ | 22) F $(+6, +0)$ | 24) R $(+5, -5)$ |

- | | | | | | | | |
|------------------------|------------------------|------------------------|------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1) $(+1, -2)$ <u>S</u> | 3) $(+4, +8)$ <u>L</u> | 5) $(+8, -2)$ <u>D</u> | 7) $(-1, +2)$ <u>O</u> | 9) I <u>$(+2, +8)$</u> | 11) E <u>$(+3, +5)$</u> | 13) C <u>$(+9, +8)$</u> | 15) X <u>$(-8, +8)$</u> |
| 2) $(+3, +6)$ <u>A</u> | 4) $(-1, -8)$ <u>Y</u> | 6) $(-3, +2)$ <u>Q</u> | 8) $(-6, +8)$ <u>J</u> | 10) H <u>$(-7, -5)$</u> | 12) W <u>$(+9, -8)$</u> | 14) G <u>$(-6, +1)$</u> | 16) P <u>$(+8, -7)$</u> |

Get the Point

Order the points in order. Do not connect points. Shaded by "Lift Pencil." Shade in a box as formed by points inside a box.

(-2,-10)
(-1,-9)
(-7,-7)
(-9,-5)
(-10,-5)
(-9,-4)
(-10,-4)
(-8,-2)
(-10,-2)
(-7,0)
(-5,4)
(-6,6)
(-10,10)
(-11,16)
(-11,18)
(-9,18)
(-5,13)
(-3,6)
(-1,6)
(2,13)
(7,16)
(10,17)
(10,16)
(8,12)
(1,5)
(2,4)
(4,0)
(6,0)
(8,-1)
(7,-1)
(8,-3)
(7,-2)
(8,-4)
(7,-4)
(5,-7)

(2,-9)
(3,-10)

Lift Pencil

(-5,7)
(-9,11)
(-10,12)
(-6,12)
(-5,7)

Lift Pencil

(1,7)
(2,11)
(4,13)
(9,16)
(6,12)
(1,7)

Lift Pencil

(0,2)
(-1,4)
(-3,2)
(-2,0)

(-1,0)
(0,2)
(-1,2)
(-2,1)
(-1,0)

Lift Pencil

(3,2)
(1,4)
(1,0)
(3,0)

(3,1)
(2,0)
(2,2)
(3,2)
(3,1)

Lift Pencil

(-7,0)
(1,-1)
(3,-1)
(2,-2)
(1,-1)

Lift Pencil

(0,-3)
(4,-3)
(3,-6)

(1,-6)
(0,-5)
(-2,-5)
(-3,-4)
(-1,-3)
(0,-3)
(1,-6)

Lift Pencil

(2,-6)
(1,-7)
(0,-7)
(2,-5)

Lift Pencil

(2,-3)
(2,-5)

Lift Pencil

(-1,-5)
(0,-6)

Lift Pencil

(4,-2)
(11,1)

Lift Pencil

(4,-2)
(11,-2)

Lift Pencil

(0,2)
(-7,-1)

Lift Pencil

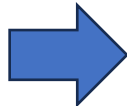
(0,-2)
(-8,-5)

Tables of Values & Coordinates

Tables of values can also be listed as a set of x & y coordinate, where each set represents a point on a graph.

For the equation $y = x - 6$

x	y
-7	-13
4	-2
5	-1
-5	-11
0	-6



Could be shown as set of coordinates: (x,y)

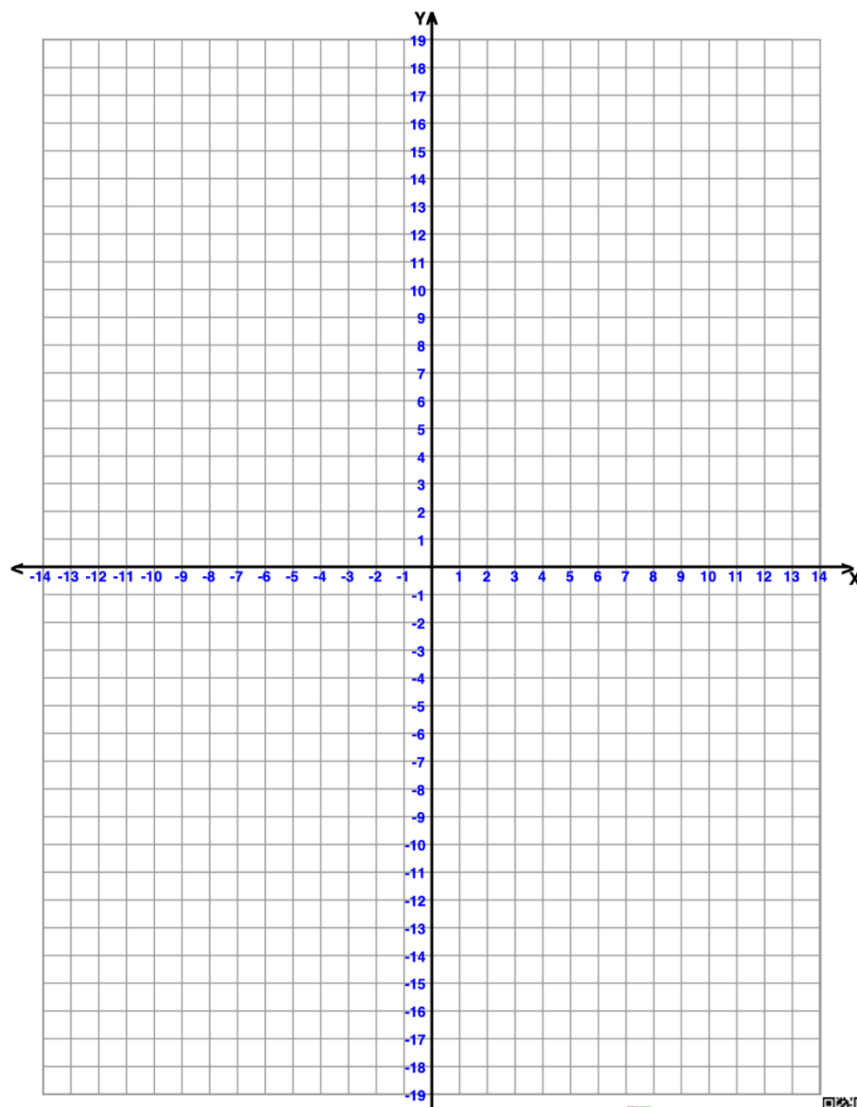
(-7, -13)

(4, -2)

(5, -1)

(-5, -11)

(0, -6)



These values can also be plotted on a graph. Place the point so the x & y value for each point lines up with the correct axis. The first coordinate is below, add in the remaining 4 points.

Plot these points:

(-7, -13)

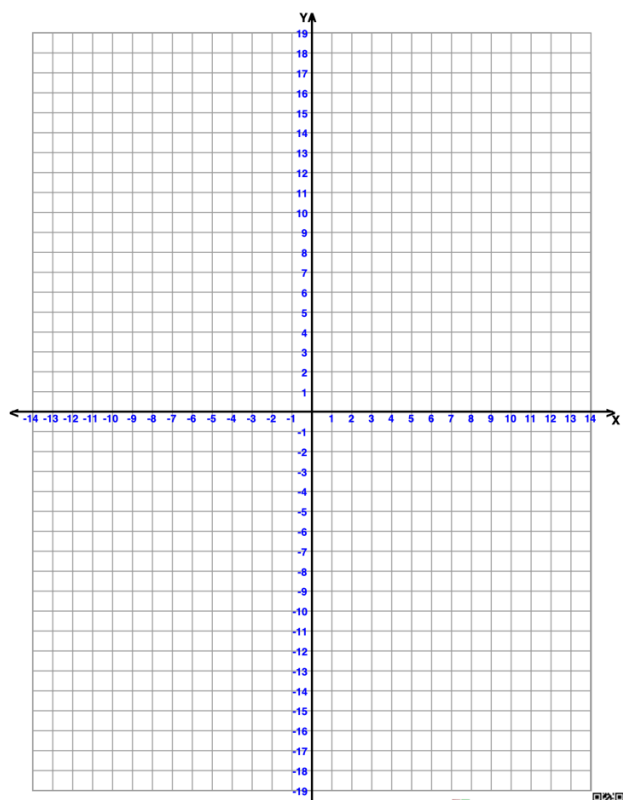
(4, -2)

(5, -1)

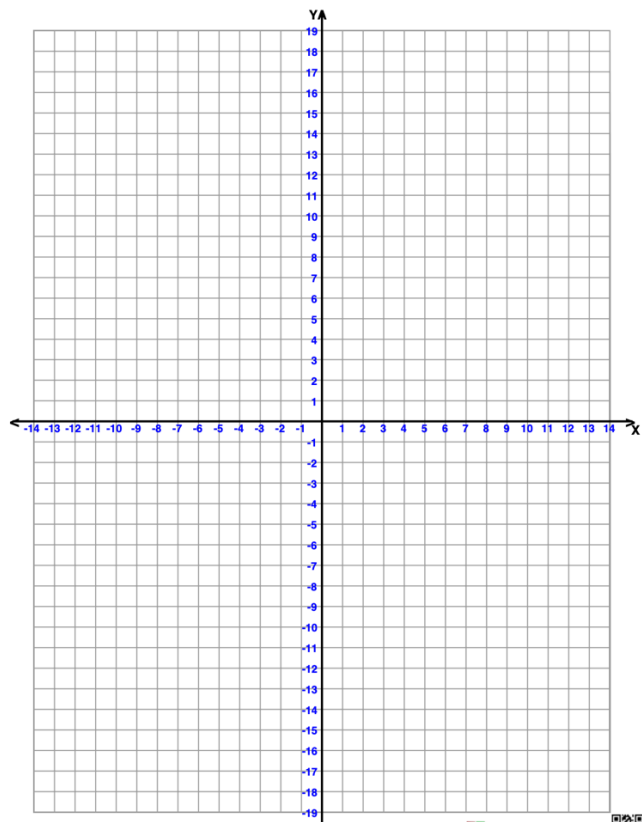
(-5, -11)

(0, -6)

Graph the following tables:



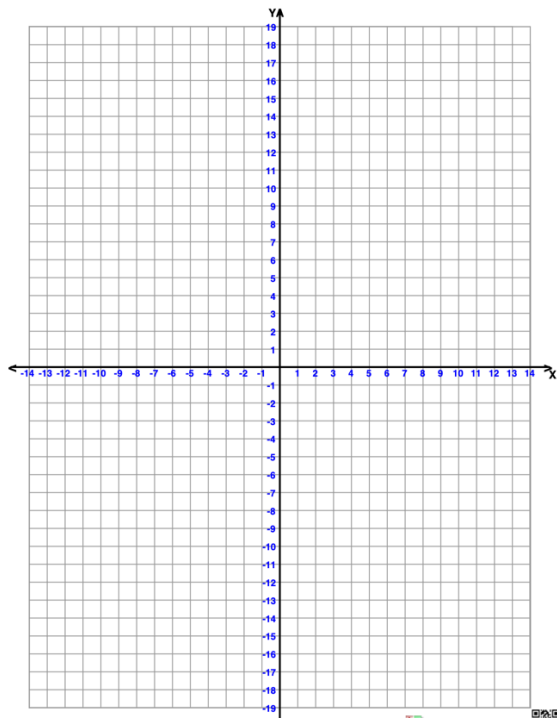
x	y
-2	10
-1	7
0	3
1	1
2	-1



x	y
-2	-15
-1	-10
0	-5
1	0
2	5

Complete the table below and plot the points on the graph for the equation:

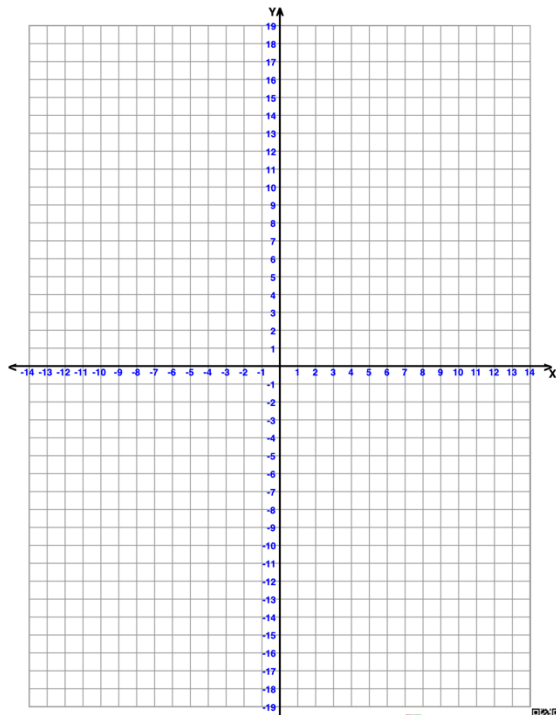
$$y = 4x + 1$$



x	y
-2	
-1	
0	
1	
2	

Complete the table below and plot the points on the graph for the equation:

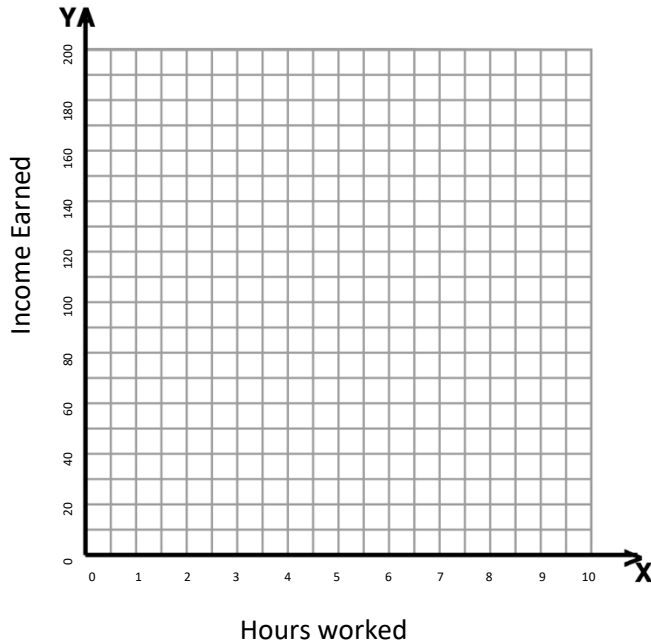
$$y = \frac{x}{2} + 1$$



x	y
-12	
-6	
0	
6	
12	

Graphing in real life.

Macey works at Starbucks and is paid an hourly rate of \$15/hr. She also gets an additional \$10 for each day that she works. Complete the table below and then graph the relation.



Hours worked	Income earned
1	
2	
3	
5	
8	

Describe the relationship between the figure number and the number of toothpicks needed for each figure.



Figure 1



Figure 2

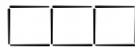
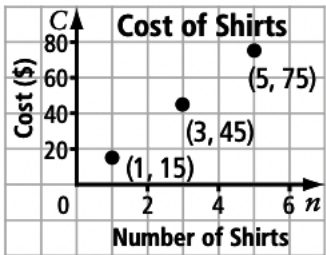


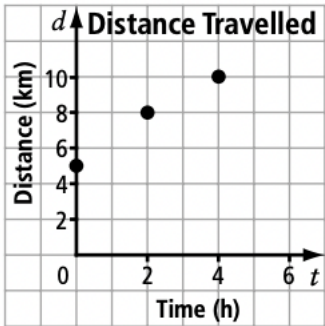
Figure 3

Figure Number	# of toothpicks needed
1	
2	
3	

Create a table of values from a graph

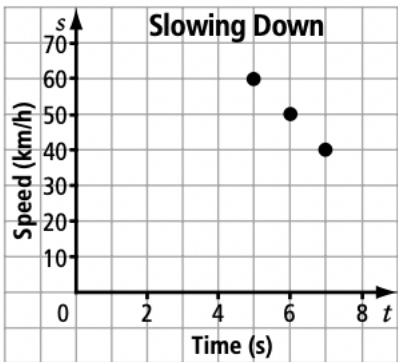


Number of Shirts	Cost (\$)



Distance (km)	Time (h)

s



Speed (km/h)	Time (s)

Reading Graphs

A line is like a whole bunch of points in a row. We can use graphs to find y values for known x values and vice versa.

This graph that shows the amount of money made per ice cream sold.

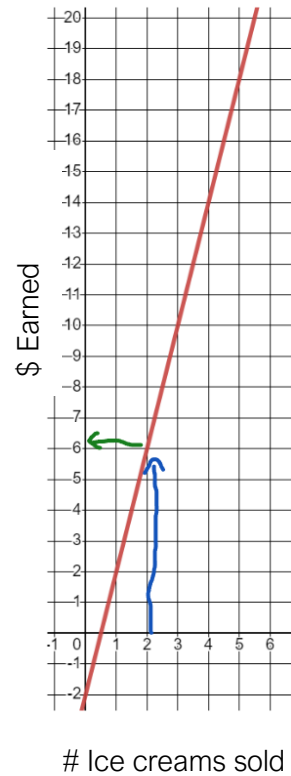
How much money is earned if you sell 2 ice creams?

- Start on the x-axis (because it represents the ice cream cones)
- Find 2 and draw a line up until you hit the diagonal line.
- Then, draw a line over to the y-axis.

We see the number that is on the y-axis is 6 dollars, so we would make 6 dollars for 2 ice creams sold.

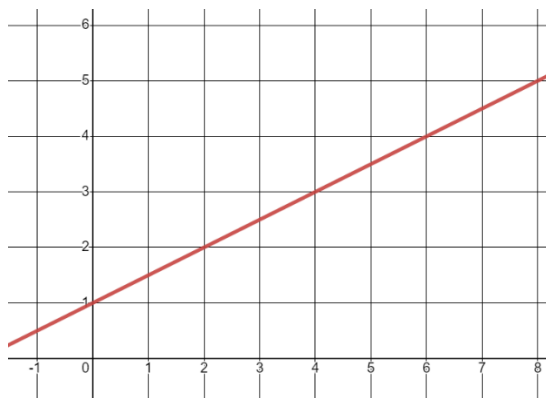
You try:

How much money is earned if you sell 5 ice creams?



Use the graphs to find the numbers being asked for.

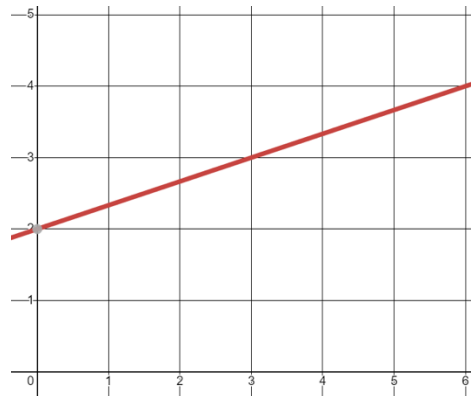
What is the y-value when x is 4?



y=_____

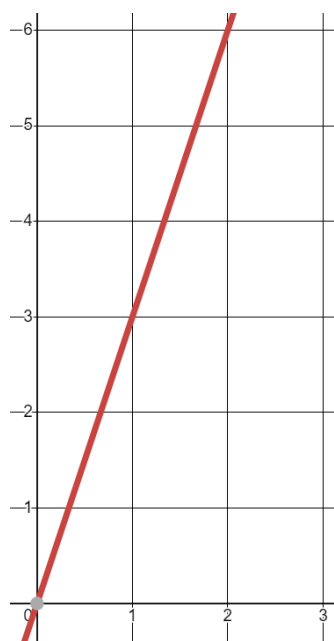
What is the x-value when y is 3?

What is the x-value when y is 3?

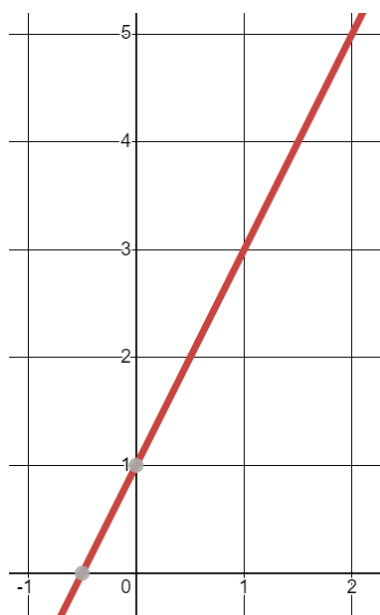


x=_____

What is the y-value when x is 2?

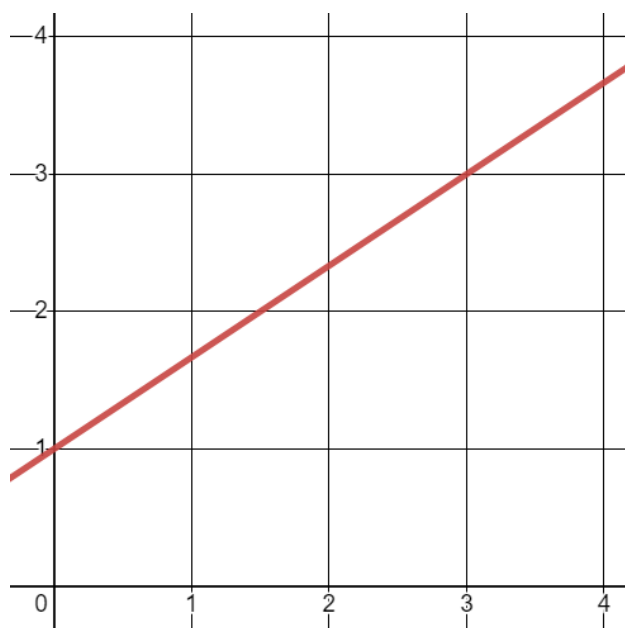


x=_____



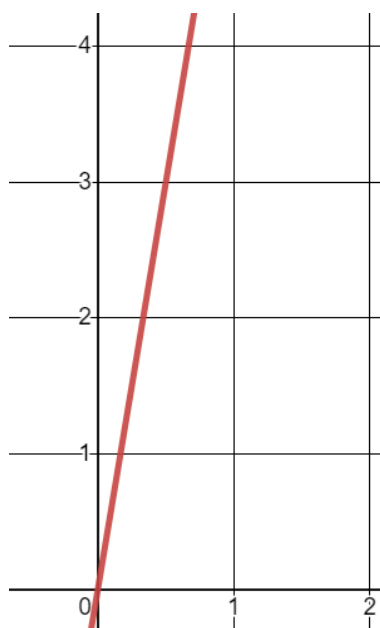
y=_____

Approximate is the x-value when y is 2?



x=_____

What is the y-value when x is 0.5?



y=_____

Use the graph below to answer the following questions.

1. How many T-shirts need to be sold to make a profit over \$300?
2. Estimate the profit made (extend the line) by selling 100 T-shirts.
3. Is it possible to have negative values for the y-axis (profit)?

