Curriculum Outcomes:

(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Student Friendly: Being able to identify a linear pattern in a t-table.

*No Decimals!

6) $x + 5y = 10$ $-x$

$\frac{5y}{5} = \frac{10}{5} - \frac{x}{5}$

$y = 2 - \frac{1x}{5}$

$y = -\frac{1}{5}x + 2$

$\Delta x = 5$ $\Delta y = -1$

	x	y
Smallest to largest	-10	4
	-5	3
	0	2
	5	1
	10	0

$y = -\frac{1}{5}x + 2$

$y = -\frac{1}{5}(5) + 2$

$y = \frac{-5}{5} + 2$

$y = -1 + 2$

$y = 1$

$y = -\frac{1}{5}(0) + 2$

$y = \frac{0}{5} + 2$

$y = 0 + 2$

$y = 2$

11) $5x - 2y = -6 - 5x$ (−5x)

$-2y = -5x - 6$

$\frac{-2y}{-2} = \frac{-5x}{-2} - \frac{6}{-2}$

$y = \frac{5x}{2} + 3$

$\Delta x = 2 \quad \Delta y = 5$

X	y
−4	−7
−2	−2
0	3
2	8
4	13

$y = \frac{5(0)}{2} + 3$

$y = 0 + 3$

$y = \frac{5(-2)}{2} + 3$

$y = \frac{-10}{2} + 3$

$y = -5 + 3$

$y = -2$

Warm-Up Grade 9

Make a table for 3 values of x.
Graph the equation.
(Pick nice numbers)

$\frac{1}{5}x + y = 1$ $-\frac{1}{5}x$

1- Rearrange my equation

$y = -\frac{1}{5}x + 1$

2- Create a table of values

x	y
-5	2
0	1
5	0

$\Delta x: +5$ $\Delta y: -1$

$y = \frac{-1(-5)}{5} + 1$

$y = \frac{5}{5} + 1$

$y = 1 + 1$

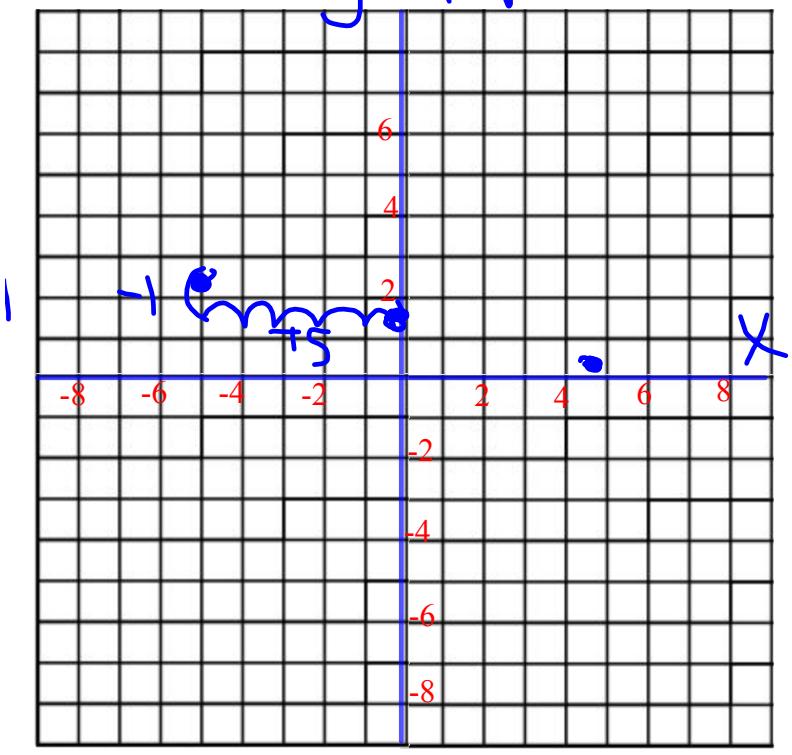
$y = 2$

$y = \frac{-1(0)}{5} + 1$

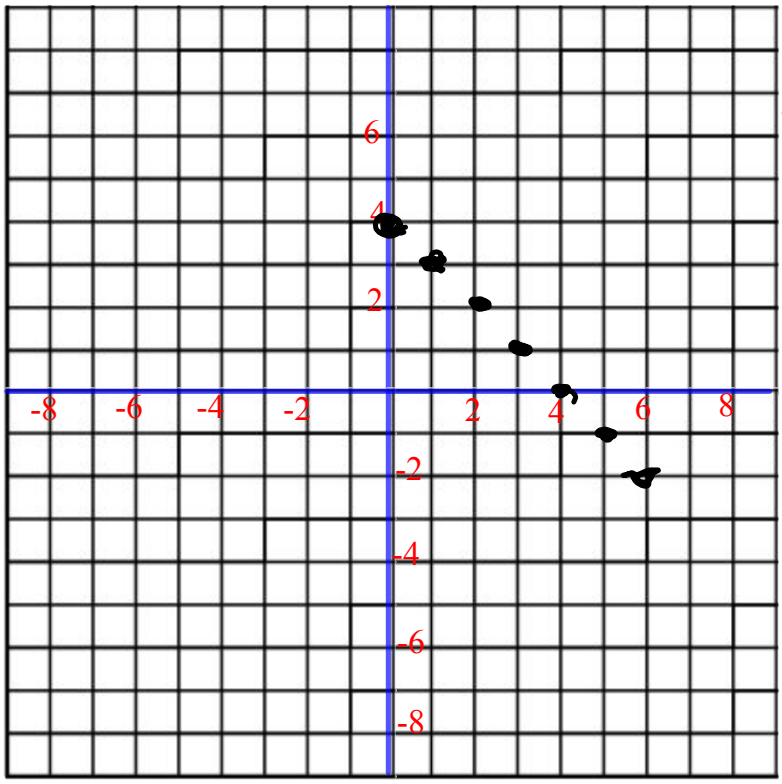
$0 + 1$

$y = 1$

3- Plot my points



Graph



$y = -x + 4$

$y = -1x + 4$

$m = \frac{-1}{1} = \frac{\text{change in } y}{\text{" in } x}$

up → positive / down → negative

left → negative / right → positive

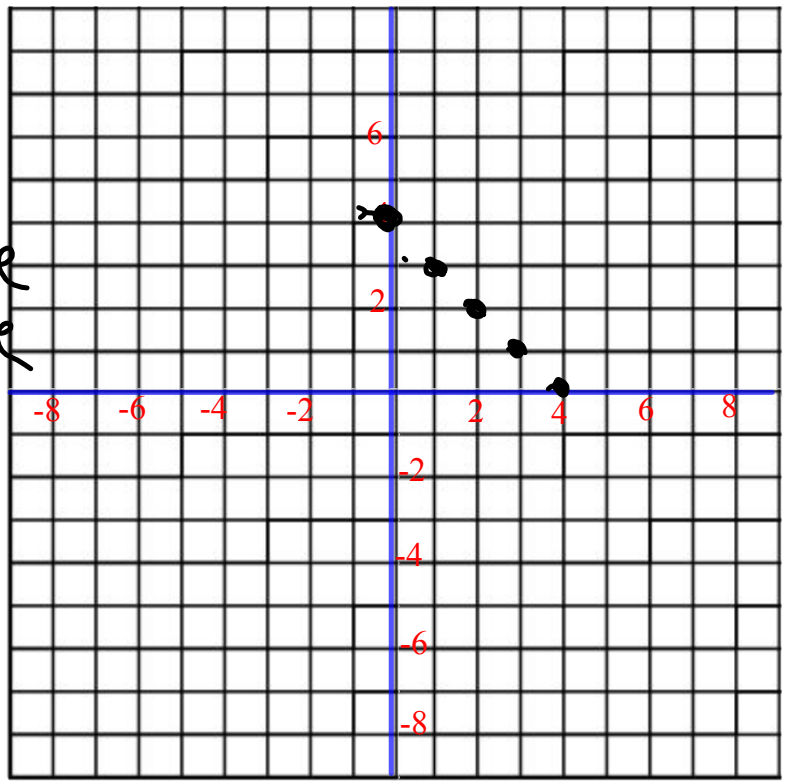
(0, 4)

$y = -\frac{-1}{1}x + 4$

$\frac{\Delta y}{\Delta x}$ ↕ ↔

negative → down
positive → up
y

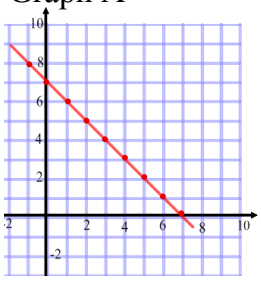
1. left → negative
right → positive



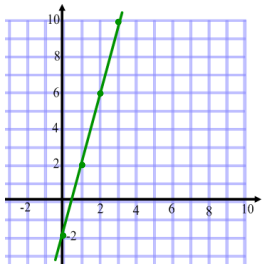
The 3 graphs below have these equations, but the graphs are not in order:

$y = 2x + 4$ $x + y = 7$ $y = 4x - 2$

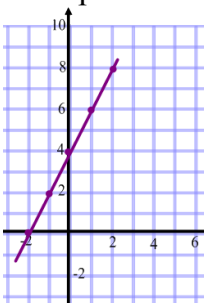
Graph A



Graph B



Graph C



Step 1) Use the three equations to determine the coordinates of the graphs.

Pick x=0, x=1, and x=2 and sub into each equation

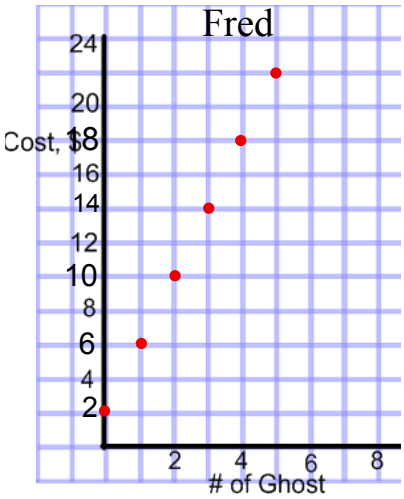
$y = 2x + 4$	$x + y = 7$	$y = 4x - 2$
Substitute: x= 0 $y = 2(0) + 4$ $= 0 + 4$ $= 4$ one point: (0,4)	$y = -(x)+7$ Substitute: x= 0 $y = -(0)+7$ $= 0 + 7$ $= 7$ one point: (0,7)	Substitute: x= 0 $y = 4(0) - 2$ $= 0 - 2$ $= -2$ one point: (0,-2)
Substitute: x= 1 $y = 2(1) + 4$ $= 2 + 4$ $= 6$ one point: (1,6)	Substitute: x= 1 $y = -(1)+7$ $= -1 + 7$ $= 6$ one point: (1,6)	Substitute: x= 1 $y = 4(1) - 2$ $= 4-2$ $= 2$ one point: (1,2)
Substitute: x= 2 $y = 2(2) + 4$ $= 4 + 4$ $= 8$ one point: (2,8)	Substitute: x= 2 $y = -(2)+7$ $= -2 + 7$ $= 5$ one point: (2,5)	Substitute: x= 2 $y = 4(2) - 2$ $= 8-2$ $= 6$ one point: (2,6)

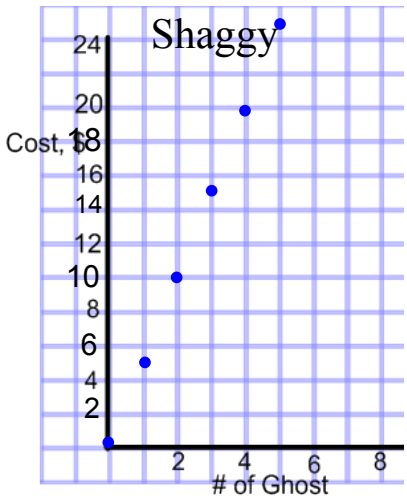
STEP 2) Match up the graph that has .

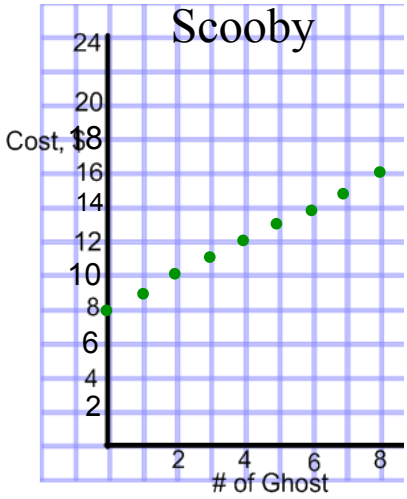
STEP 3) Match up the graph that has .

STEP 4) Match up the graph that has .

Fred, Shaggy and Scooby are hired to find ghosts. Each ghost hunter charges a different rate. These graphs show how the cost is related to the number of ghosts caught.







Match each graph with its equation:

$C = g + 8$

$C = 0 + 8$

$C = 8$

$(0, 8)$

Scooby

$C = 5g$

$C = 5(0)$

$C = 0$

$(0, 0)$

Shaggy

$C = 4g + 2$

$C = 4(0) + 2$

$0 + 2$

$C = 2$

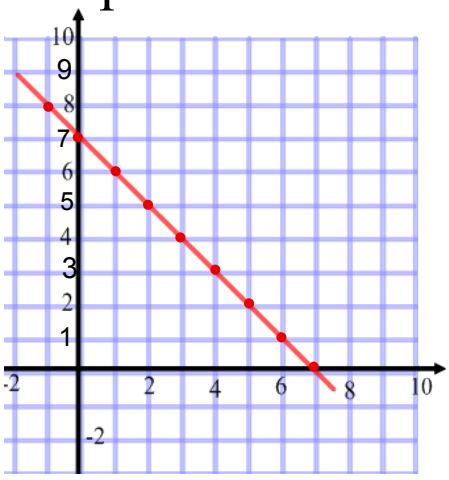
$(0, 2)$

Fred

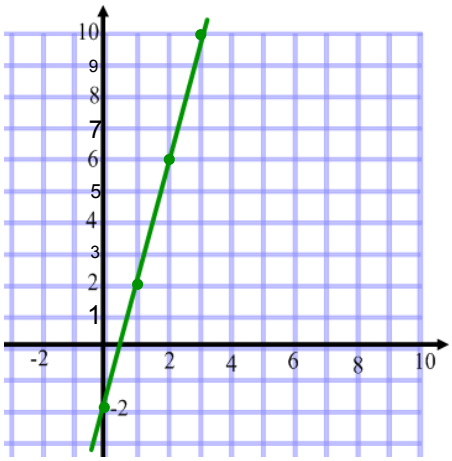
The 3 graphs below have these equations, but the graphs are not in order:

$y = 2x + 4$	$x + y = 7$	$y = 4x - 2$

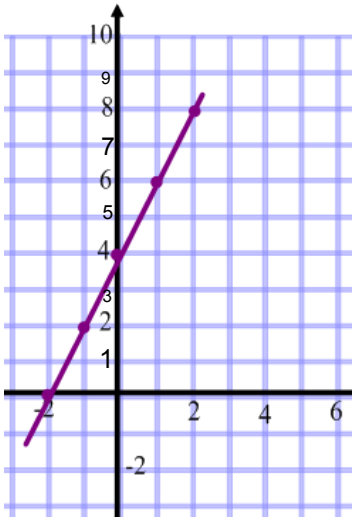
Graph A



Graph B



Graph C



The 3 graphs below have these equations, but the graphs are not in order:

$y = x + 4$

$y = 0 + 4$

$y = 4$

(A)

$(0, 4)$

$y = 1 + 4$

$y = 5$

$(1, 5)$

$x - y = 6$

$-y = -x + 6$

$y = x - 6$

$y = 0 - 6$

$y = -6$

$(0, -6)$

Line C

$y = -3x + 4$

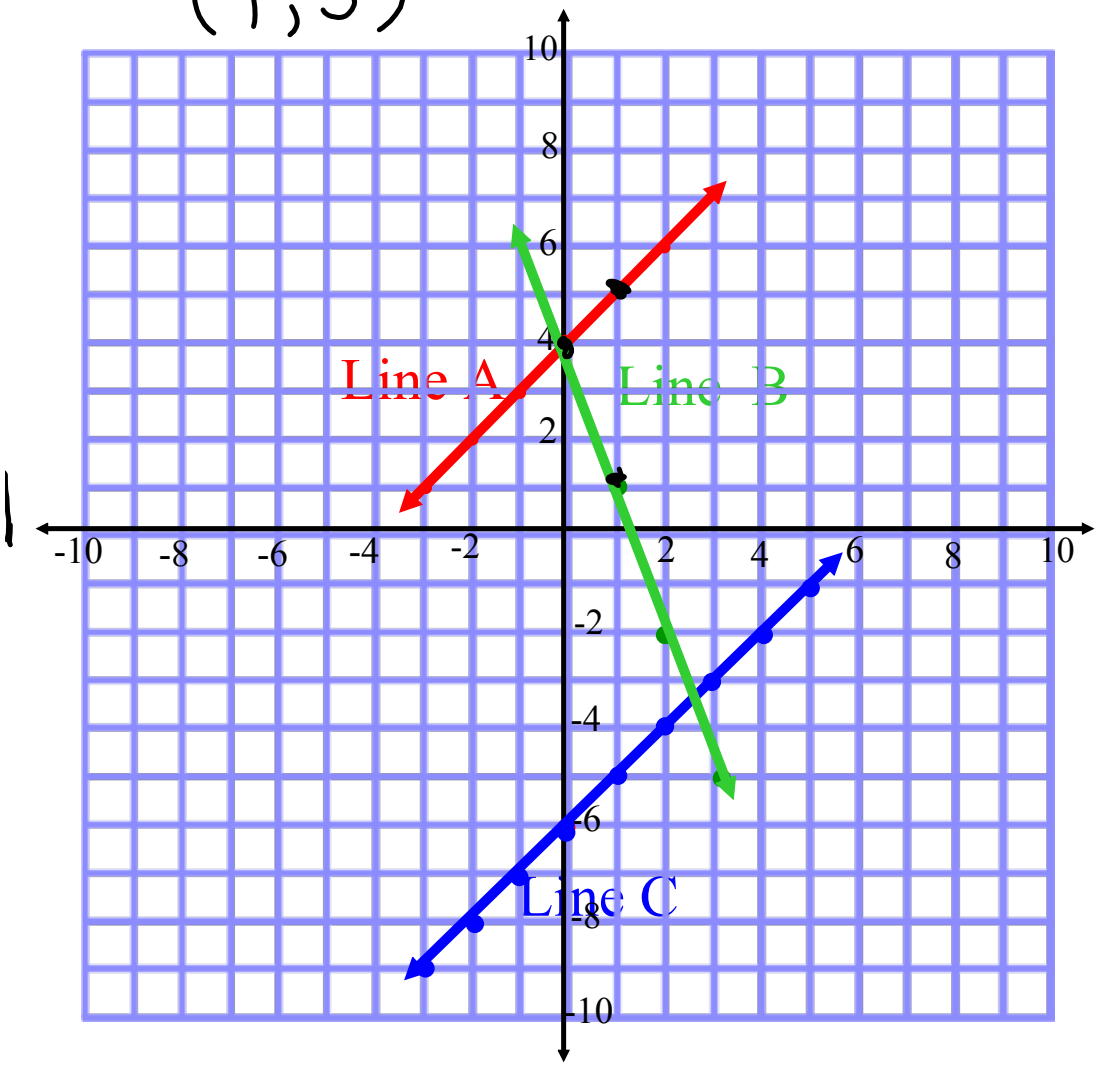
$y = -3(0) + 4$

$y = 0 + 4$

$y = 4$

$(0, 4)$

(B)



6) $x + 5y = 10 - x$

$\frac{5y}{5} = \frac{10}{5} - \frac{x}{5}$

$y = 2 - \frac{1x}{5}$

$\Delta x = 5 \quad \Delta y = -1 \quad y = \frac{-1x}{5} + 2$

x	y
−10	4
−5	3
0	2
5	1
10	0

Small to Large

$\frac{\Delta y}{\Delta x}$

$y = \frac{-1(0)}{5} + 2$

$y = \frac{0}{5} + 2$

$y = 0 + 2$

$y = 2$

$y = \frac{-1(5)}{5} + 2$

$y = -\frac{5}{5} + 2$

$y = -1 + 2$

$y = 1$

NO Decimals

10) $x - 2y = -2^{-x}$

$-2y = -2 - 1x$

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

$\frac{-2}{-2} = 1$

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

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

$\Delta x = 2 \quad \Delta y = 1$

x	y
-4	-1
-2	0
0	1
2	2
4	3

+2 +2

$y = \frac{1(0)}{2} + 1$

$y = 0 + 1$

$y = 1$

$y = \frac{1(-2)}{2} + 1$

$\frac{-2}{2} + 1$

$-1 + 1$

$y = 0$

8) $4x + 7y = -21 - 4x$

$\frac{7y}{7} = \frac{-4x}{7} - \frac{21}{7}$

$y = \frac{-4x}{7} - 3$

$\Delta x = 7 \quad \Delta y = -4$

x	y
14	5
-7	1
0	-3
7	-7
14	-11

$y = \frac{-4(0)}{7} - 3$

$0 - 3$

$y = -3$

$-3 - \frac{4x}{7}$

$-3 - \frac{4(-7)}{7}$

$-3 - (-4)$

$-3 + 4$

$-3 - \frac{4(0)}{7}$

$-3 - 0$

$\frac{-4(-7)}{7} - 3$

7) $x + 7y = -35 - x$

$-x$

$\frac{7y}{7} = \frac{-x}{7} - \frac{35}{7}$

$\Delta x = 7 \quad \Delta y = -1$

$y = \frac{-1x}{7} - 5$

x	y
-14	-3
-7	-4
0	-5
7	-6
14	-7

$y = -\frac{1}{7}(0) - 5$

$y = 0 - 5$

$y = -5$

$y = \frac{-1(-7)}{7} - 5$

$y \frac{7}{7} - 5$

$y = 1 - 5$

$y = -4$

12) $3x + 5y = 10 - 3x$ (−3x)

$\frac{5y}{5} = \frac{-3x}{5} + \frac{10}{5}$

$\Delta x = 5$ $\Delta y = -3$

x	y
10	8
−5	5
0	2
5	−1
10	−4

$y = \frac{-3x}{5} + 2$

$y = \frac{-3(0)}{5} + 2$

$y = 0 + 2$

$y = 2$

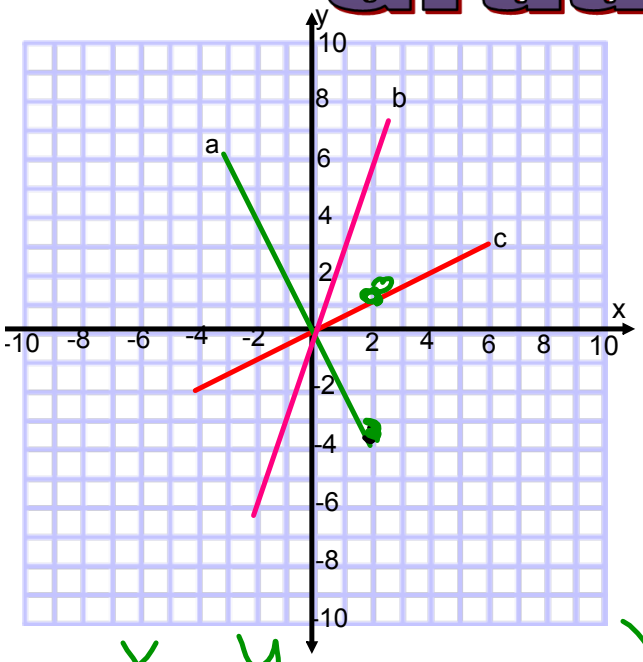
$\frac{-3(-5)}{5} + 2$

$\frac{15}{5} + 2$

$3 + 2$

$y = 5$

Warm-Up Grade 9



Method 1:

Use a table of values to match the following equations to the correct graph.

x	y
2	1

C (2,1)

x	y
2	-4

A (2,-4)

x	y
2	6

B

i) $y = \frac{1}{2}x$

$y = \frac{1(2)}{2}$

$y = \frac{2}{2}$

$y = 1$

ii) $y = -2x$

$y = -2(2)$

$y = -4$

iii) $y = 3x$

$y = 3(2)$

$y = 6$

If you always rearrange first

$Y = 3x + 7$

x	y
-1	4
0	7
1	10
2	13

The number in front of "x" in the equation represents the slope:
Slope: (how steep a line is)

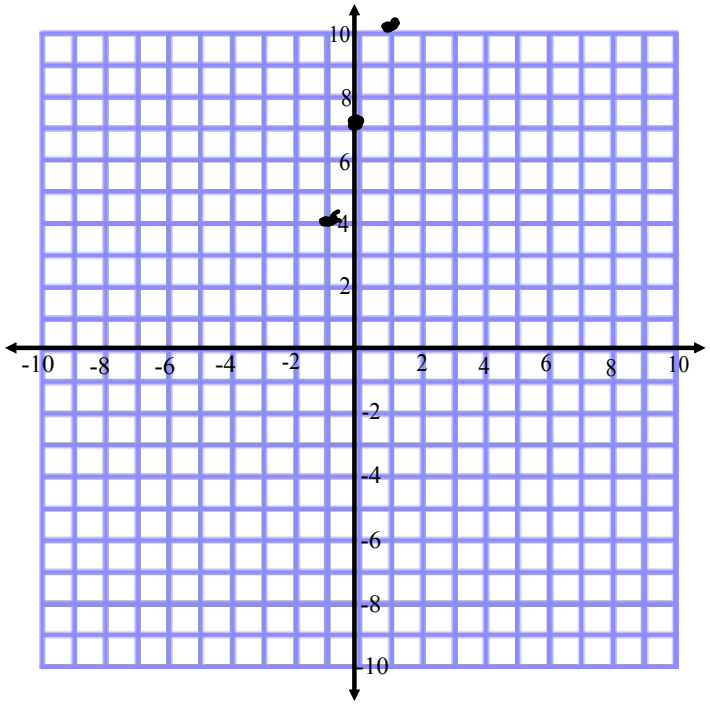
What we notice: when x increases by 1, y increases by 3

$$\text{Slope} = \frac{\text{change in y}}{\text{change in x}} \quad \text{or} \quad \frac{\text{change in RISE}}{\text{change in RUN}}$$

Thus

$$\text{Slope} = \frac{3}{1} = 3$$

What does this graph look like?
click to see

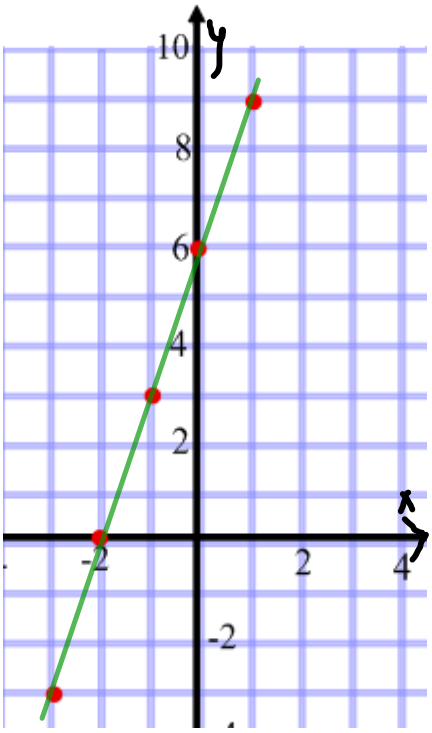


Which equation represents the graph?

rise / run

1

pick an x value to sub in



Pick the correct equation

a) $y = -5x + 6$

$\frac{\Delta y}{\Delta x}$

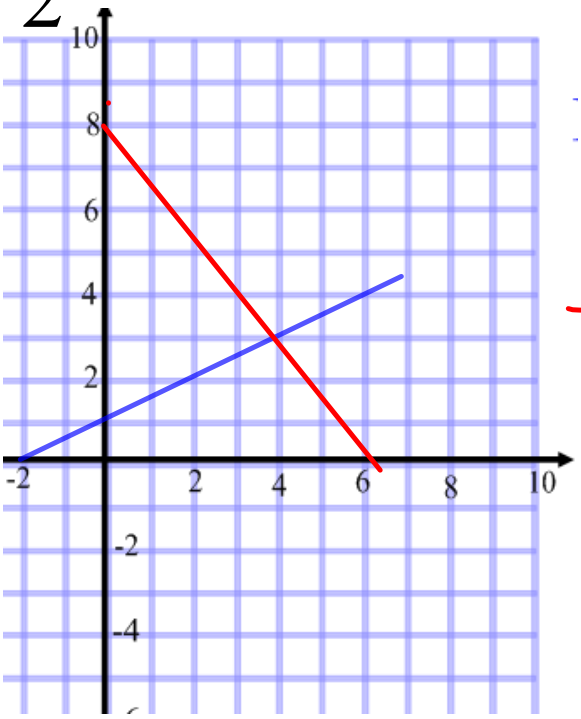
b) $y = 3x + 6$

$\frac{3}{1}$

c) $y = 2x - 5$

Which equation represents the graph?

2



Pick the correct equation

a) $y = \frac{3}{2}x + 1$

$\frac{\Delta y}{\Delta x}$ $\frac{1}{2}$

b) $y = 2x + 1$

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

$\uparrow 1 \cdot \frac{\Delta y}{\Delta x} = \frac{1}{2}$

$\rightarrow 2$

Quiz

Homework

page 188 - 190

#3 - #9

10, 11, 12

Worksheet

Attachments

Graphing Equation_ws.docx