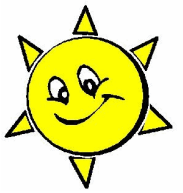
Curriculum Outcomes:

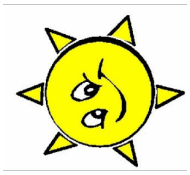
(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(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.



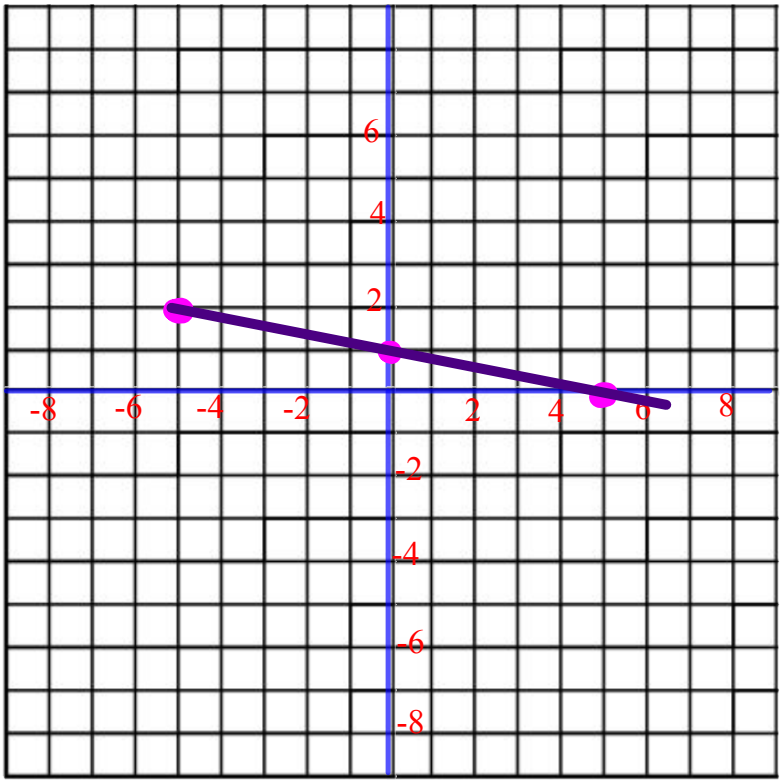
Warm-Up Grade 9



$y = \frac{\Delta y}{\Delta x} x \pm \#$

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

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



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

$\Delta x = 5$

x	y	Δy
-5	2	-1
0	1	-1
5	0	

$x = -5$

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

$y = 1 + 1$

$y = 2$

$x = 0$

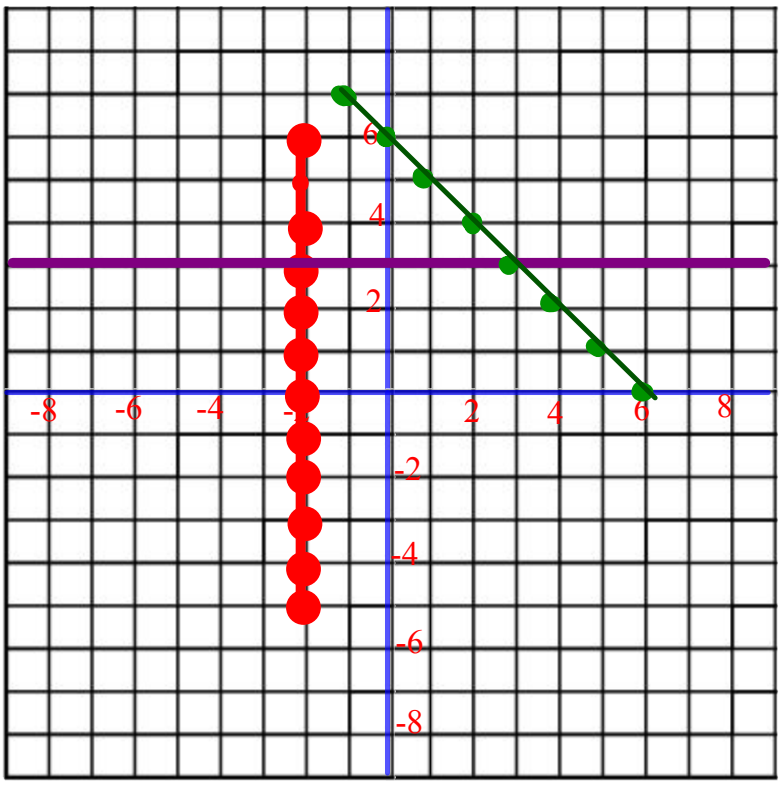
$y = -\frac{1}{5}(0) + 1$

$y = 0 + 1$

$y = 1$

Graph

$x=-2$



$y+5=8$ (−5 −5)

$y=3$

$x+y=6$ (−x −x)

$y=\frac{-1}{1}x+6$

$x=1$

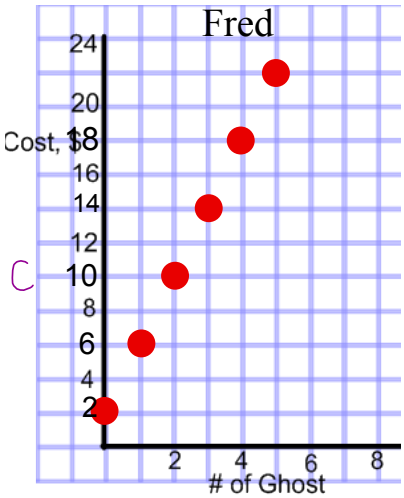
$y=-1(1)+6$

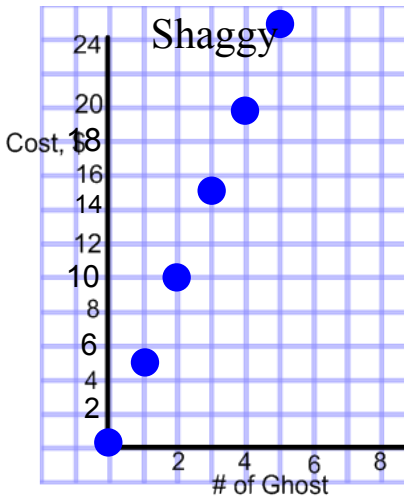
$y=1+6$

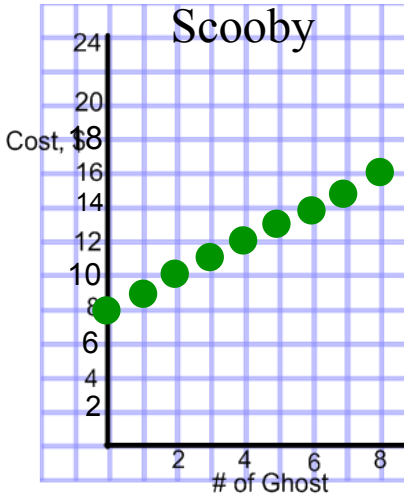
$y=7$

x	y	
-1	7	)-1
0	6	)-1
1	5	

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:

$C = g + 8$

$g = 0$

$C = 0 + 8$

$C = 8$

$(0, 8)$

Scooby

$C = 5g$

$g = 0$

$C = 5(0)$

$C = 0$

$(0, 0)$

Shaggy

$C = 4g + 2$

$g = 0$

$C = 4(0) + 2$

$C = 0 + 2$

$C = 2$

$(0, 2)$

Fred

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

$y = 2x + 4$

$x = 0$

$y = 2(0) + 4$

$y = 0 + 4$

$y = 4$

$(0, 4)$

Graph C

$x + y = 7$

$y = -x + 7$

$x = 0$

$y = -0 + 7$

$y = 7$

$(0, 7)$

Graph A

$y = 4x - 2$

$x = 0$

$y = 4(0) - 2$

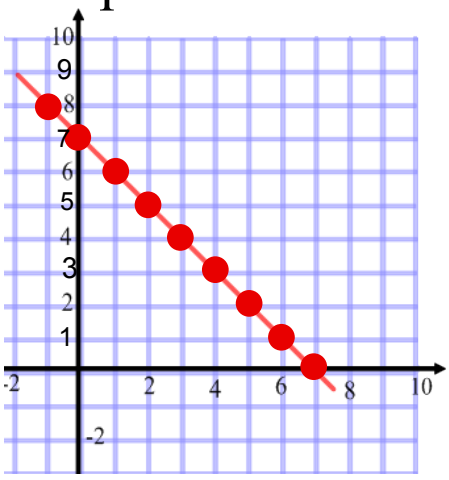
$y = 0 - 2$

$y = -2$

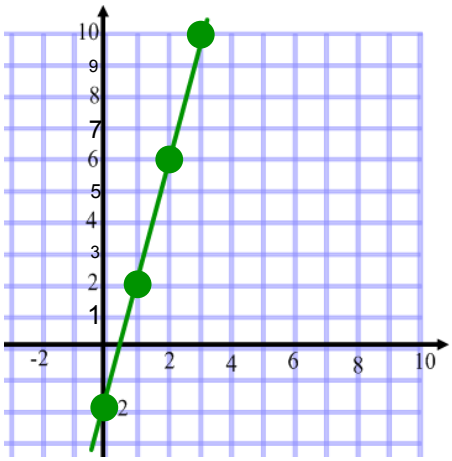
$(0, -2)$

Graph B

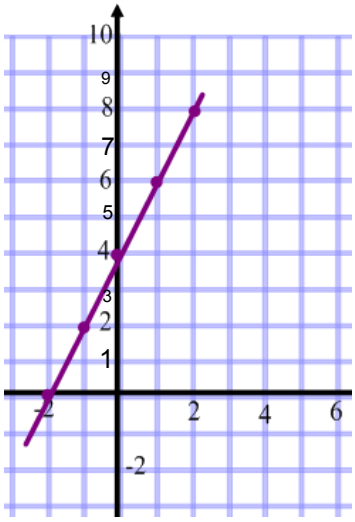
Graph A



Graph B



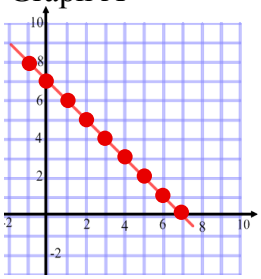
Graph C



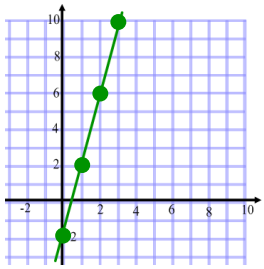
The 3 graphs below have these equations, but the graphs are not in order:

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

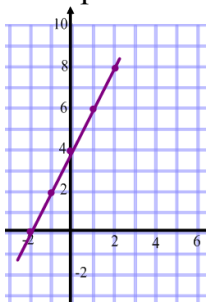
Graph A



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		
one point:)	one point: ( )	one point: ( )
Substitute: x= 1	Substitute: x= 1	Substitute: x= 1
one point: ( )	one point: ( )	one point: ( )
Substitute: x= 2	Substitute: x= 2	Substitute: x= 2
one point: ( )	one point: ( )	one point: ( )

STEP 2) Match up the graph that has

STEP 3) Match up the graph that has

STEP 4) Match up the graph that has

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

$y = x + 4$

$x = 0$

$y = 0 + 4$

$y = 4$

$(0, 4)$, $\frac{\Delta y}{\Delta x} = \frac{1}{1}$

A

$x - y = 6$

$-y = -x + 6$

$y = x - 6$

$x = 0$

$y = 0 - 6$

$y = -6$

$(0, -6)$, $\frac{\Delta y}{\Delta x} = \frac{1}{1}$

C

$y = -3x + 4$

$x = 0$

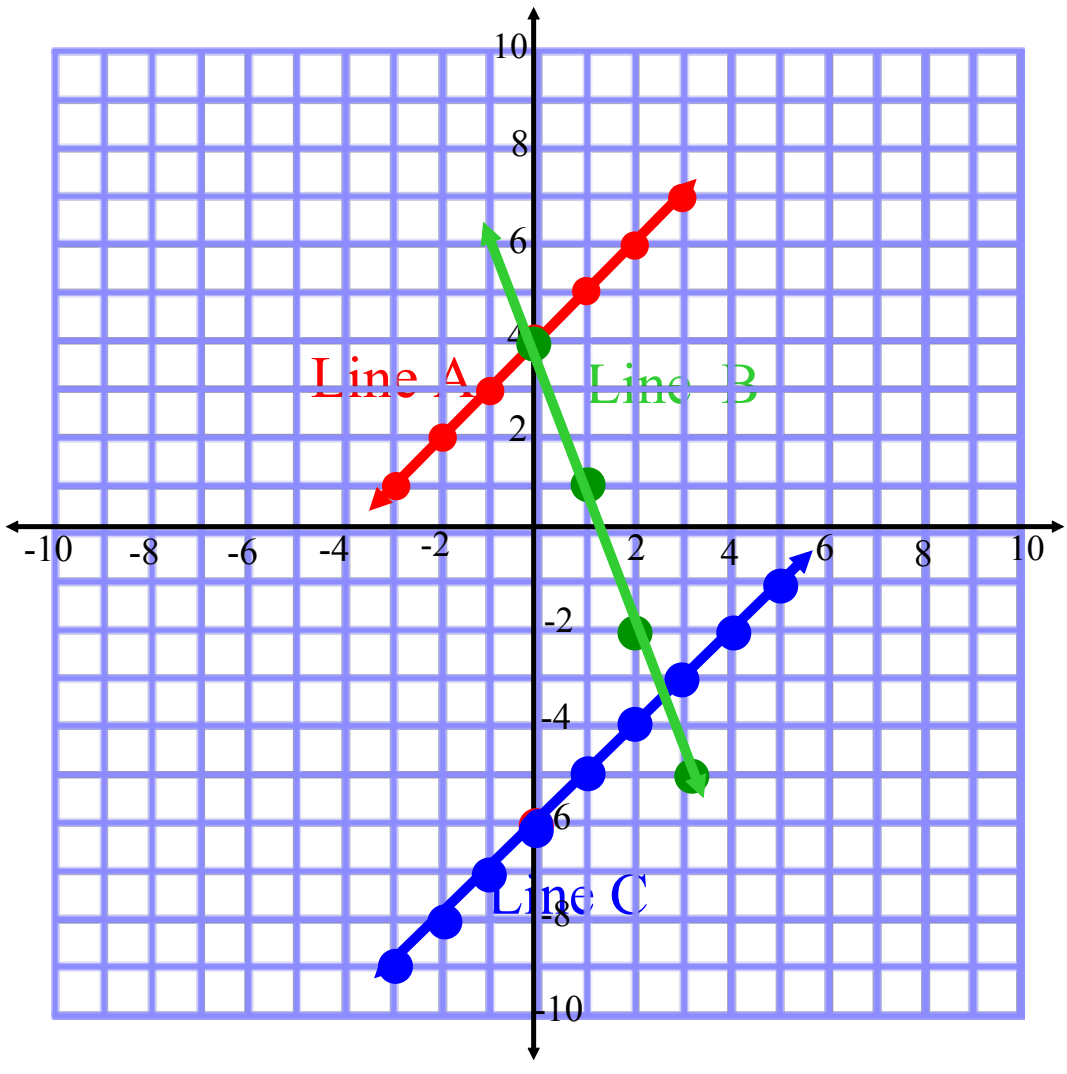
$y = -3(0) + 4$

$y = 0 + 4$

$y = 4$

$(0, 4)$, $\frac{\Delta y}{\Delta x} = \frac{-3}{1}$

B



If you always rearrange first

$Y = 3x + 7$ ← (0, #)

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

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**

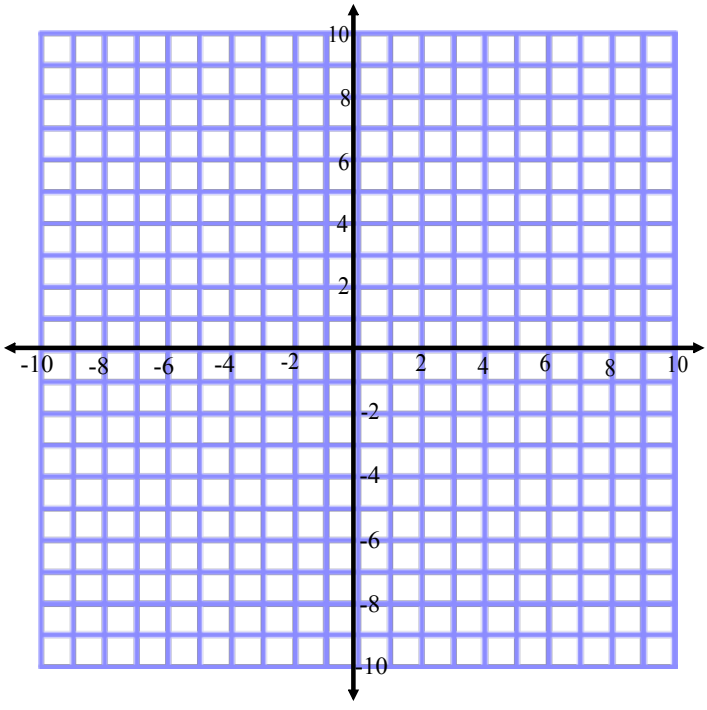
$$\text{Slope} = \frac{\text{change in y}}{\text{change in x}} \quad \text{or} \quad \frac{\text{change in RISE}}{\text{change in RUN}}$$

Thus

$$\text{Slope} = \frac{3}{1} \rightarrow \frac{\text{rise up 3}}{\text{run over 1 right}}$$

What does this graph look like?

click to see

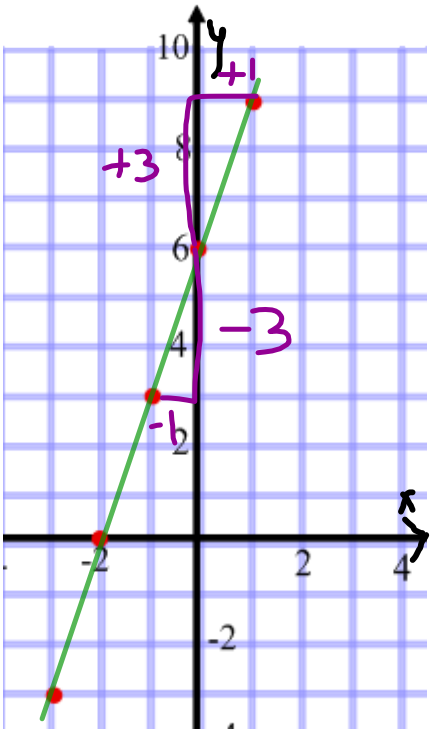


Which equation represents the graph?

rise / run

1

pick an x value to sub in



Pick the correct equation

a) y = -5x +6

x = 0
y = 6
(0, 6)

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

b) y = 3x +6

x = 0
y = 6
(0, 6)

$\frac{\Delta y}{\Delta x} = \frac{3}{1}$

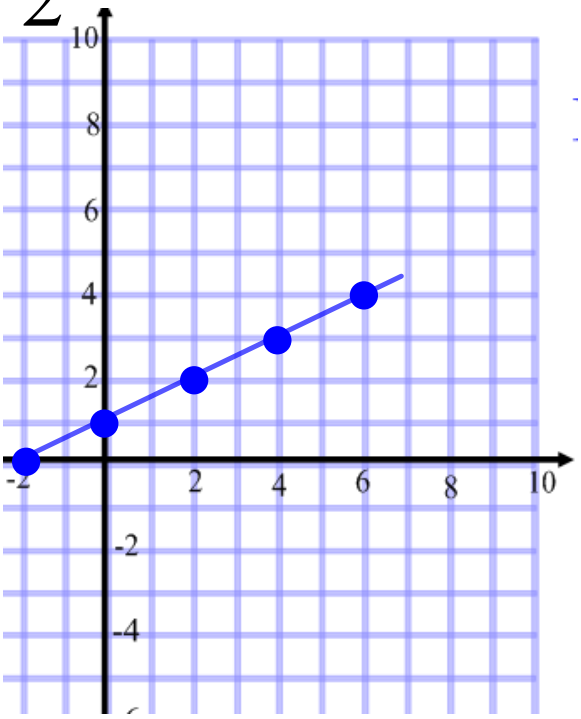
c) y = 2x - 5

x = 0
y = -5
(0, -5)

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

Which equation represents the graph?

2



Pick the correct equation

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

b) $y = 2x + 1$

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

Homework

Worksheet
Questions 3,4,5