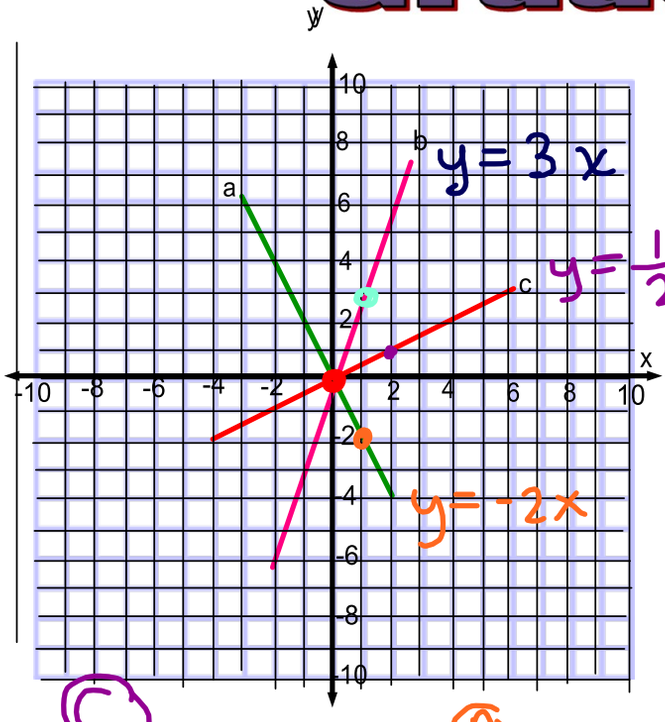
Curriculum Outcomes:

(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



Method 2:
Use slope and a point

C

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

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

$x = 0$

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

$y = 0$

$(0, 0)$

A

ii) $y = -2x$

$\frac{\Delta y}{\Delta x} = \frac{-2\downarrow}{1\rightarrow}$

$x = 0$

$y = -2(0)$

$y = 0$

$(0, 0)$

B

iii) $y = 3x$

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

$x = 0$

$y = 3(0)$

$y = 0$

$(0, 0)$

$x + 2y = -6$

$2y = -x - 6$

$y = \frac{-1}{2}x - 3$

$\frac{\Delta y}{\Delta x} = \frac{-1}{2}$ ↓ →

$x = 0$

$(0, -3)$

$10x - 7y = 35$

$-10x$ -10

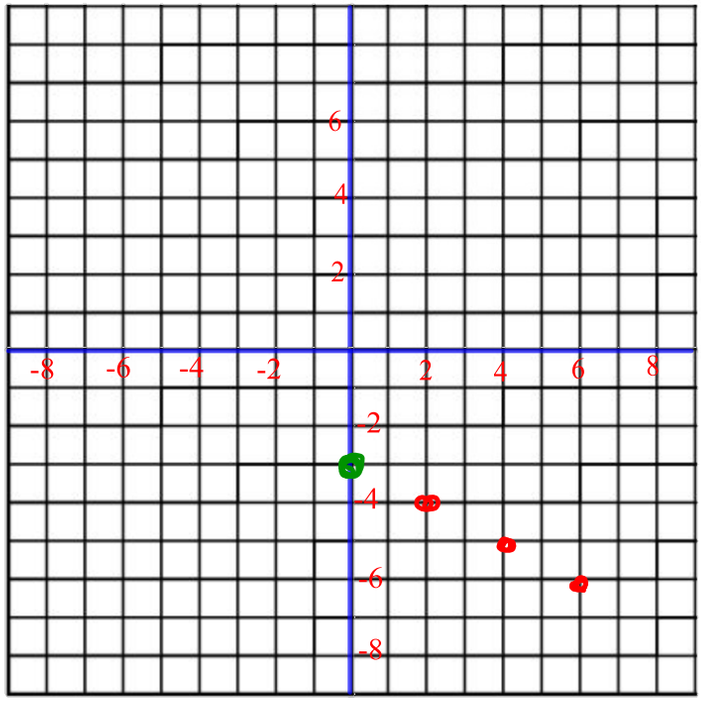
$\frac{-7y}{-7} = \frac{-10x}{-7} + \frac{35}{-7}$

$y = \frac{10}{7}x - 5$

$\frac{\Delta y}{\Delta x} = \frac{10}{7}$

$x = 0$

$(0, -5)$



If you always rearrange first

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

$Y = \frac{1}{1}x + \square$

x	y
-1	4
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

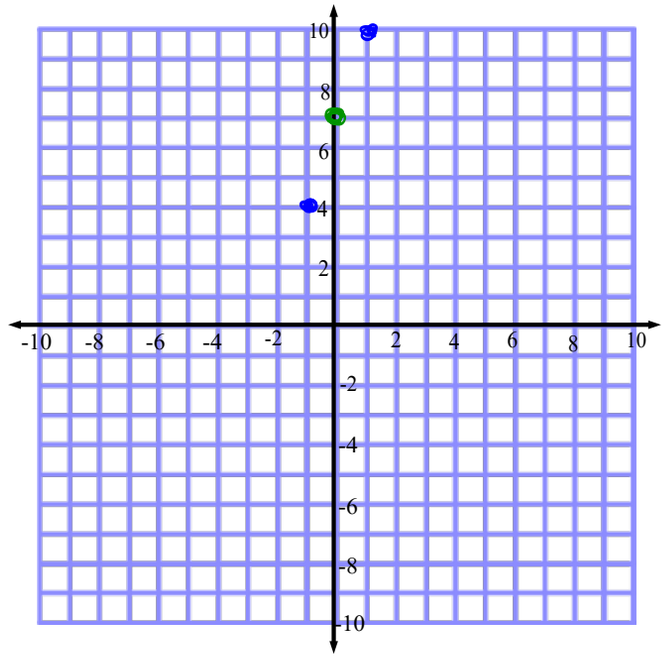
$$\text{Slope} = \frac{\text{change in y}}{\text{change in x}} \quad \text{or} \quad \frac{\text{change in RISE}}{\text{change in RUN}}$$

Thus

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

What does this graph look like?

click to see



$y = 3x + 7$

$\frac{\Delta y}{\Delta x} = \frac{3\uparrow}{1\rightarrow} = \frac{-3}{-1}$

(0,7)

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

$$y = \frac{-1}{2}x + 10$$

$$y = \frac{1}{-2}x + 10$$

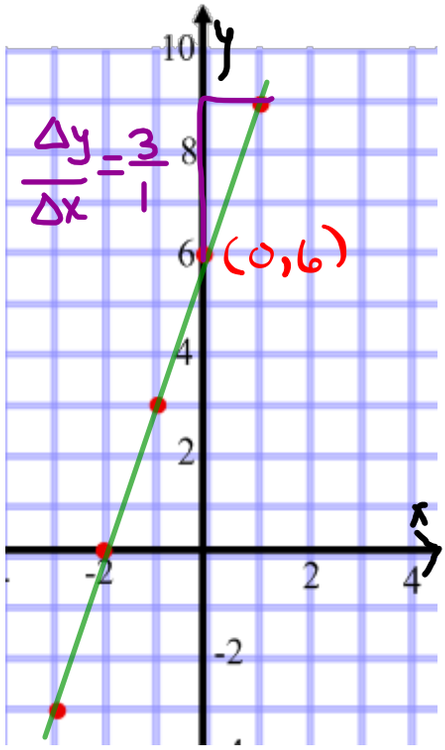
$$\frac{\Delta y}{\Delta x} = \frac{-1}{2} = \frac{1}{-2}$$

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

Which equation represents the graph?

rise / run

1



Pick the correct equation

a) $y = -5x + 6$

$\frac{\Delta y}{\Delta x} = \frac{-5}{1}$ (0, 6)

b) $y = 3x + 6$

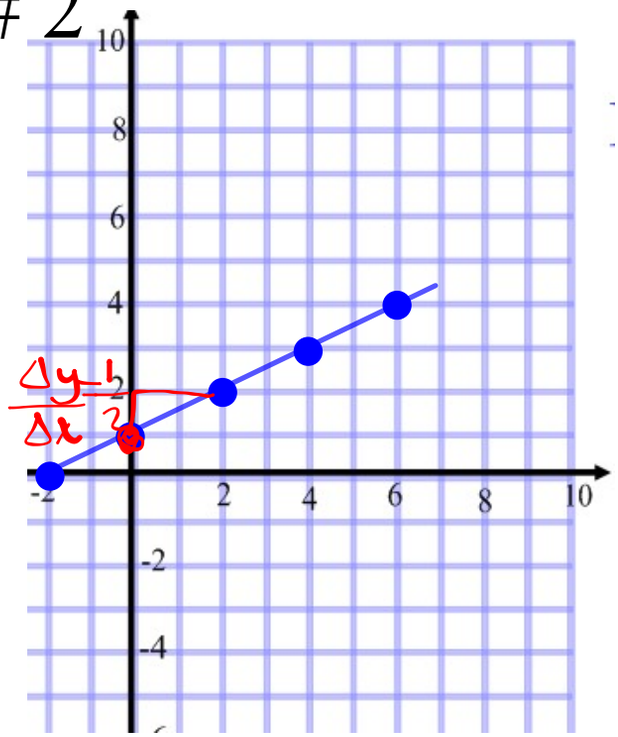
$\frac{\Delta y}{\Delta x} = \frac{3}{1}$ (0, 6)

c) $y = 2x - 5$

$\frac{\Delta y}{\Delta x} = \frac{2}{1}$ (0, -5)

Which equation represents the graph?

2



Pick the correct equation

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

$\frac{\Delta y}{\Delta x} = \frac{3}{2}$ (0, 1)

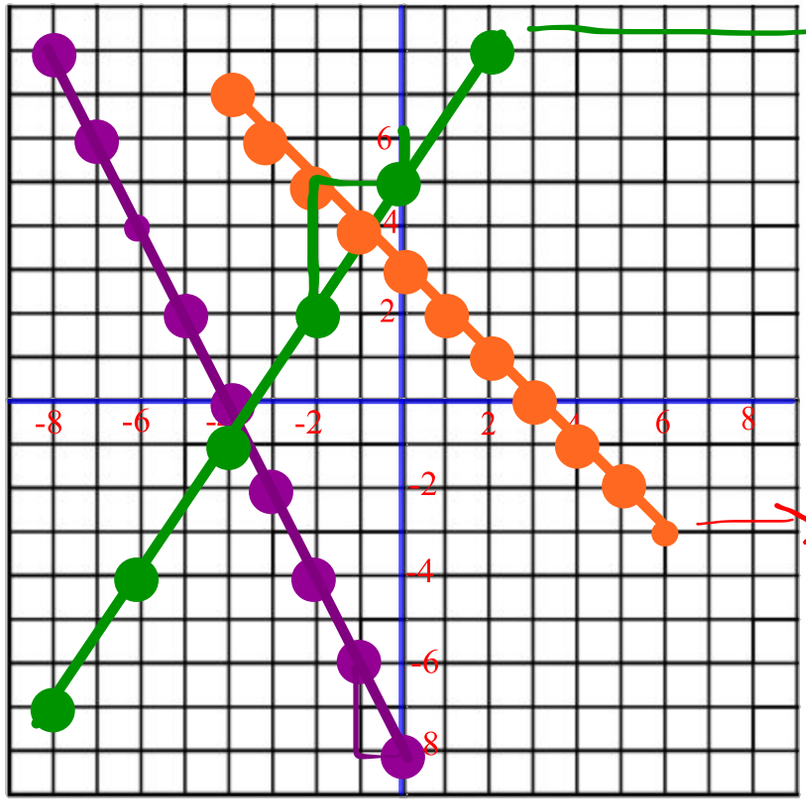
b) $y = 2x + 1$

$\frac{\Delta y}{\Delta x} = \frac{2}{1}$ (0, 1)

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

$\frac{\Delta y}{\Delta x} = \frac{1}{2}$ (0, 1)

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



$\frac{\Delta y}{\Delta x} = \frac{3}{2}$

$(0, 5)$

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

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

$(0, 3)$

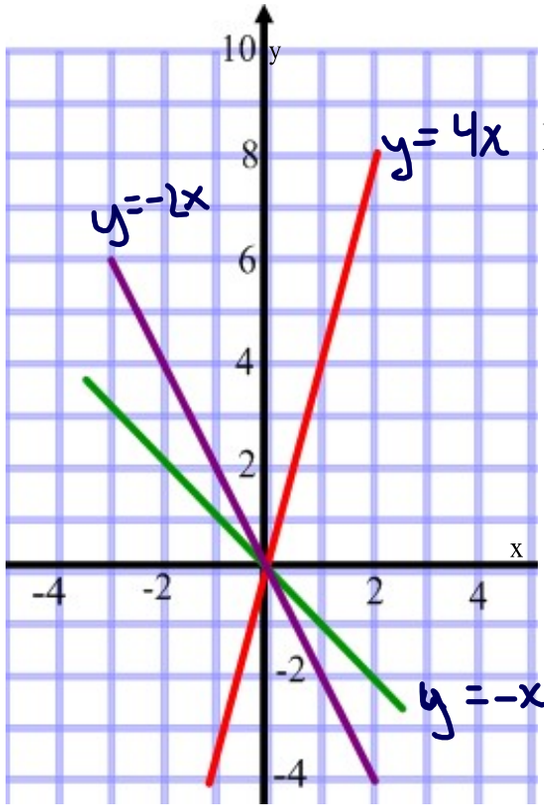
$y = \frac{-1}{1}x + 3$

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

$(0, -8)$

$y = \frac{-2}{1}x - 8$

Matching Equations with Graphs that Pass Through the Origin



Match each graph on the grid with its equation

- (Use the previous slide to help answer)

$y = -x$ green

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

$y = 4x$ red

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

$y = -2x$ purple

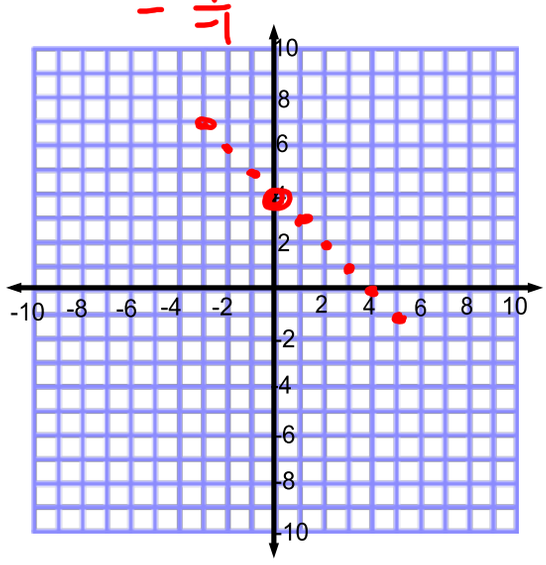
$\frac{\Delta y}{\Delta x} = \frac{-2}{1}$ (0,0)

Graph the following using the point-slope formula

$x + y = 4$

$y = -x + 4$

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

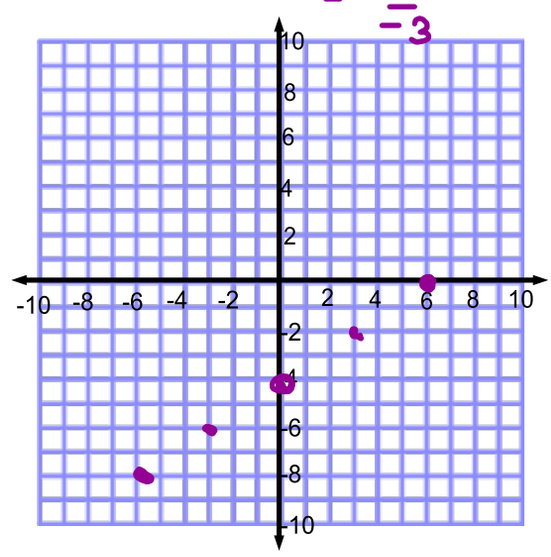


$2x - 3y = 12$

$-3y = -2x + 12$

$y = \frac{2}{3}x - 4$

$\frac{\Delta y}{\Delta x} = \frac{2}{3} = \frac{-2}{-3}$ (0, -4)



Homework

Worksheet #2
Questions 1-16

worksheet