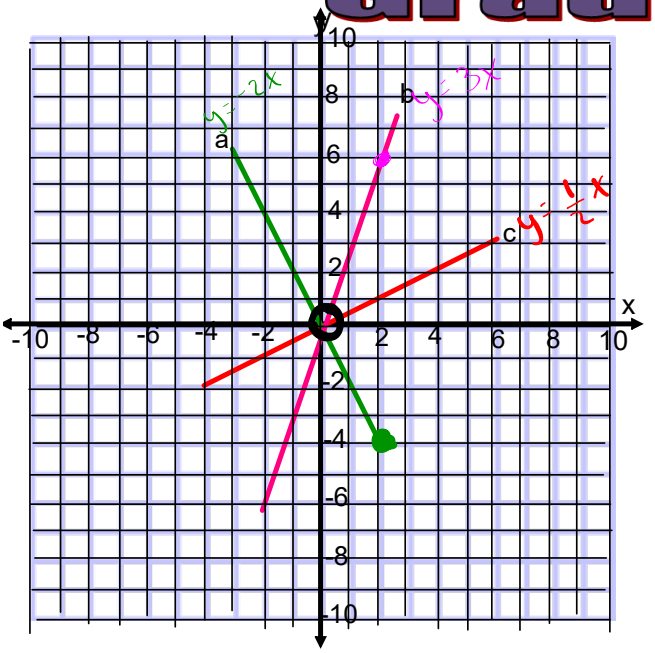
Curriculum Outcomes:

(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: Matching a linear graph to an equation using ordered pairs and rise over run.

Warm-Up Grade 9



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

x= 0 x= 2

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

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

y= 0 y= 1

(0,0) (2,1)

C

ii) y= -2x

x= 0 x= 2

y= -2x y= -2x

y= -2(0) = -2(2)

y= 0 y= -4

(0,0) (2,-4)

A

iii) y= 3 x

x= 0 x= 2

y= 3 x y= 3 x

y= 3 (0) y= 3 (2)

y= 0 y=6

(0,0) (2,6)

B

If you always rearrange first

slope (0,#)

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

$$Y = 3x + 2$$

x=0 (0, 2)

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**

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

Thus

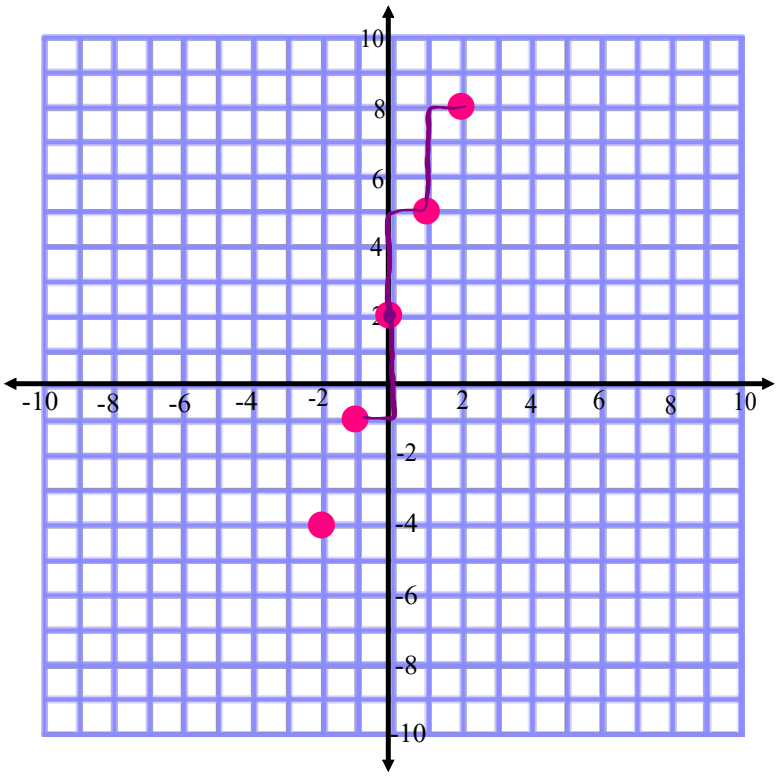
$$\frac{\Delta y}{\Delta x} = \frac{3}{1}$$

↑ run up 3

→ over right 1

$$Y = 3x + 2$$

What does this graph look like?
click to see



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

$\Delta x = 1$ $\Delta y = 3$

x	y
-2	-4
-1	-1
0	2
1	5
2	8

+1 +1 +1

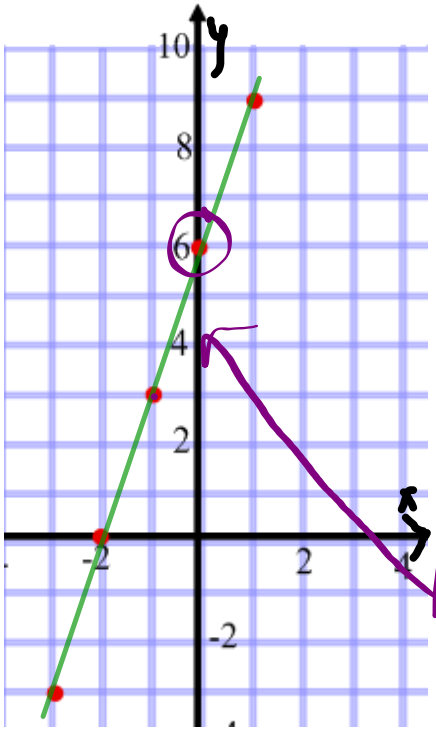
+3 +3 +3 +3

$\frac{3}{1} = \frac{-3}{-1}$

Which equation represents the graph?

1

pick an x value to sub in



Pick the correct equation

a) y = -5x +6

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

b) y = 3x +6

x= 0
y = 3(0) +6
y= 0 + 6
y= 6
(0,6)

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

$\frac{-3}{-1}$

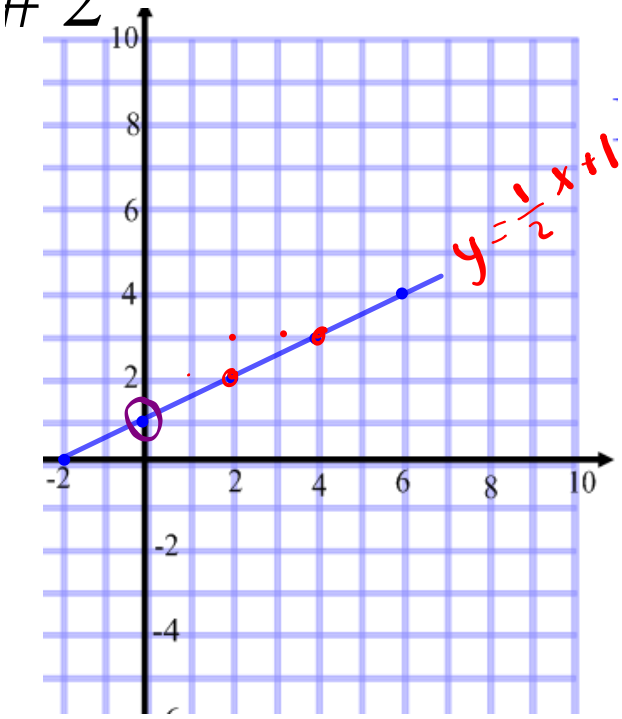
c) y = 2x - 5

x= 0
y = 2(0) -5
y= 0 - 5
y= -5
(0,-5)

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

Which equation represents the graph?

2



Pick the correct equation

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

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

y = 3/2(0) +1
y= 0 + 1
y= 1
(0,1)

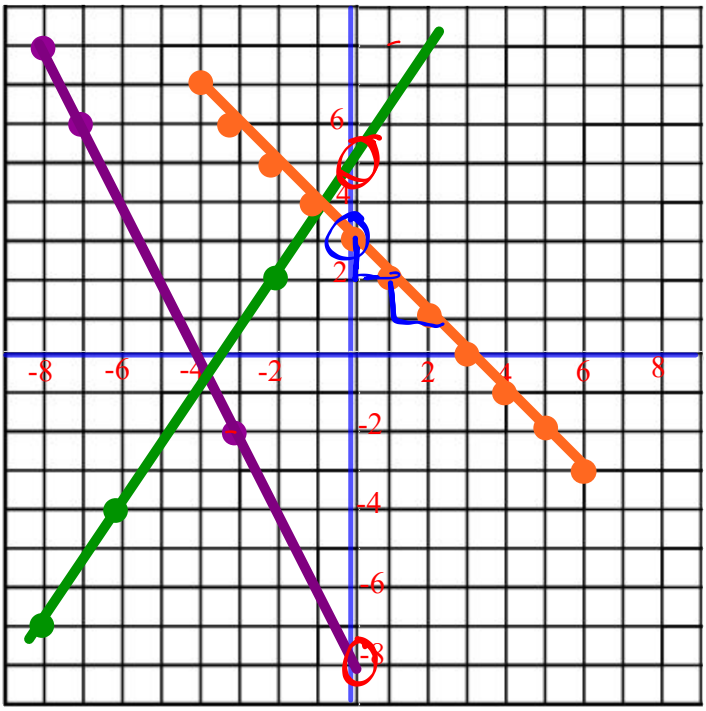
b) $y = 2x + 1$

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

y = 2(0) +1
y= 0 + 1
y= 1
(0,1)

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

y = 1/2(0) +1
y= 0 + 1
y= 1
(0,1)



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

Green

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

x= 0

(0, 5)

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

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

Orange

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

x= 0

(0, 3)

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

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

$y = -x + 3$

Purple

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

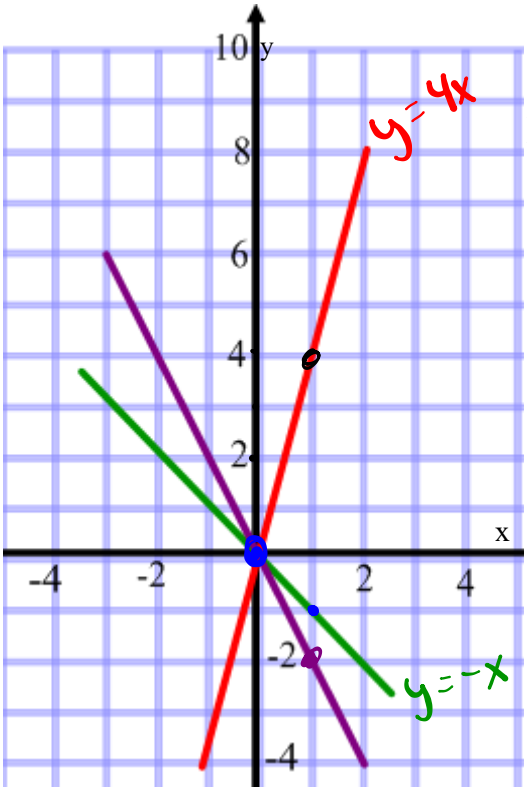
x= 0

(0, -8)

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

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

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)

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

Green

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

red

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

Purple

Graph the following using the point-slope formula

hint: must rearrange first $y = \frac{\Delta y}{\Delta x}x \pm \#$ Point

Slope

$-x \quad -x$

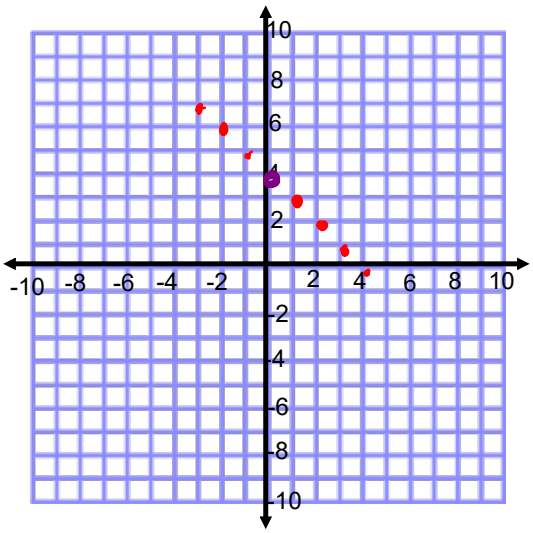
$$x + y = 4$$

$$y = -x + 4$$

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

x= 0

(0, 4)



$-2x \quad -2x$

$$2x - 3y = 12$$

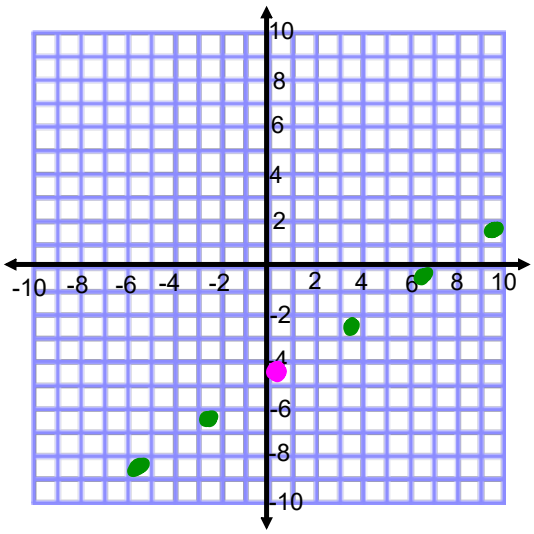
$$\frac{-3y}{-3} = \frac{-2x}{-3} + \frac{12}{-3}$$

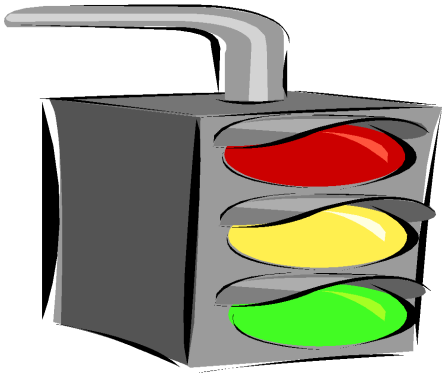
$$y = \frac{2}{3}x - 4$$

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

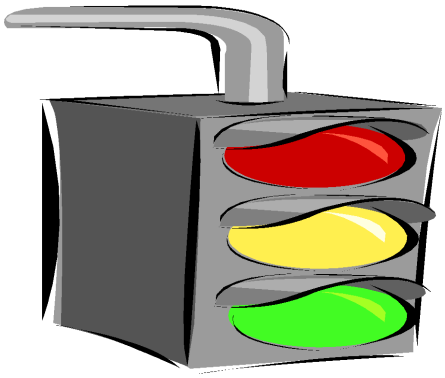
x= 0

(0, -4)





Now it is time for Home Learning



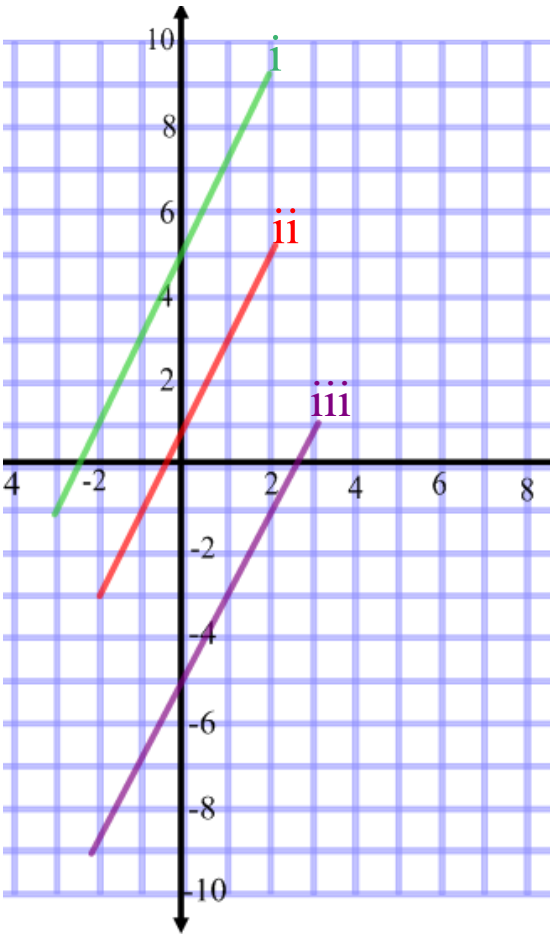
Class/Homework

Worksheet 1

&

Worksheet 2

Which graph represents the equation?



Which graph represents y= 2x - 5?

MUST JUSTIFY
your answer

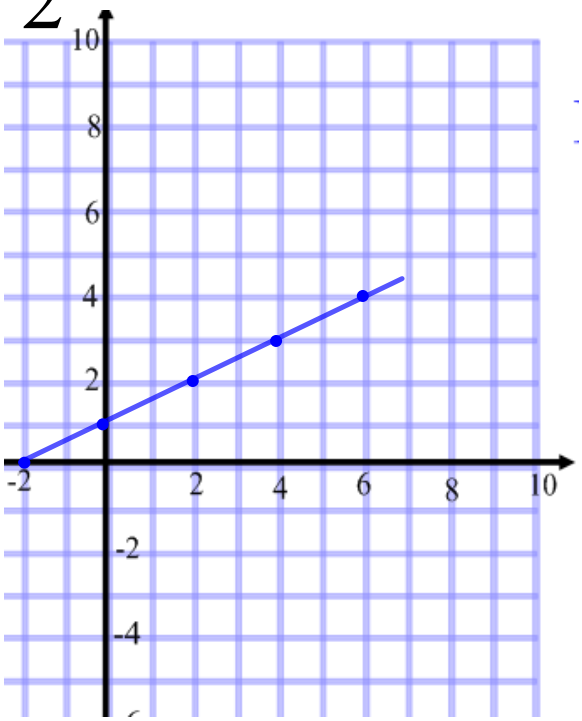
x= 0

(0,__)

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

Which equation represents the graph?

2



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

x= 0

(0,_ _)

Pick the correct equation

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

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

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

Attachments

Graphing Equation_ws.docx

Linear Eqautions and Graphs .pdf