Math 9
Ch. 4 – Linear Relations

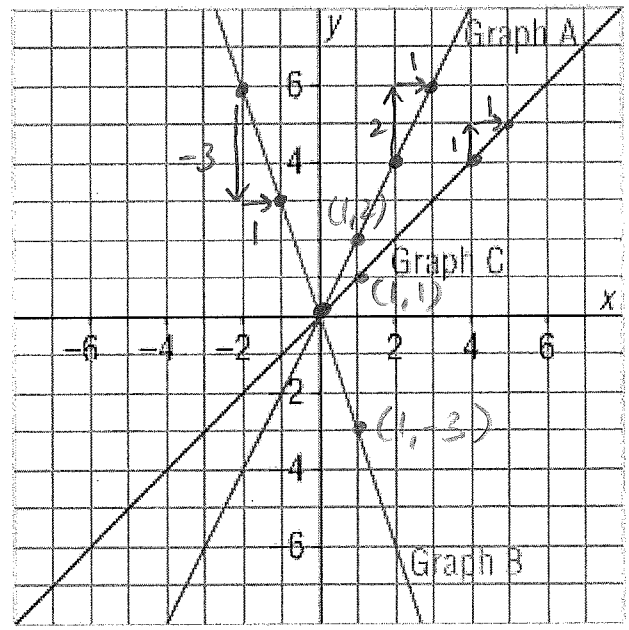
Name: KEY

Block: _____

4.4 – Matching Equations and Graphs

Ex. 1: Match each graph on the grid with its equation:

$y = x$ $\qquad$ $y = 2x$ $\qquad$ $y = -3x$



Method 1: Choose an x-value and substitute it into each equation to determine the corresponding y-value. This will give you a coordinate. Look for the graph that goes through this coordinate.

*Don't choose $x=0$ since all 3 graphs have the same y-value there ($y=0$)

Choose $x=1$:

$y=x \Rightarrow y=1 \therefore (1,1)$ $\boxed{\text{Graph C}}$

$y=2x \Rightarrow y=2(1)=2 \therefore (1,2)$ $\boxed{\text{Graph A}}$

$y=-3x \Rightarrow y=-3(1)=-3 \therefore (1,-3)$ $\boxed{\text{Graph B}}$

Method 2: Find the y-intercept and the slope from the equation and see which graph has these properties.

$y=x$ (same as $y=\frac{1}{1}x+0$) rise 1, run 1, y-int 0 C

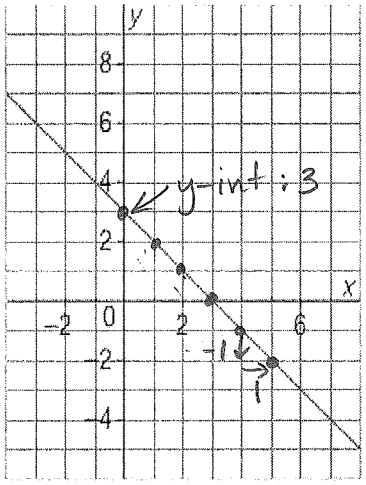
$y=2x$ (same as $y=\frac{2}{1}x+0$) rise 2, run 1, y-int. 0 A

$y=-3x$ (same as $y=\frac{-3}{1}x+0$) drop 3, run 1, y-int 0 B

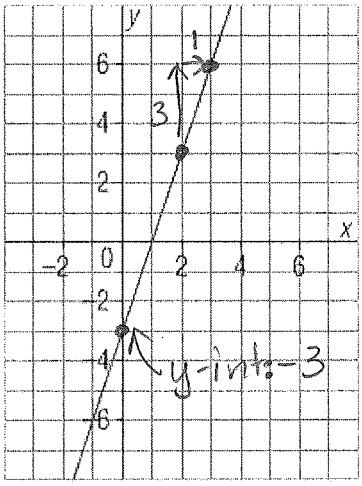
Ex. 2: Match each of these equations with either graph A, B, or C.

$y = 3x + 3$ $\qquad$ $x + y = 3$ $\qquad$ $y = 3x - 3$

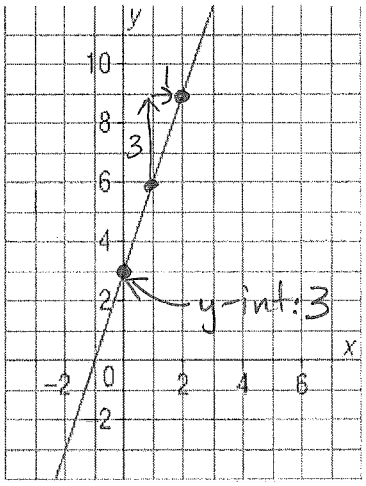
Graph A



Graph B



Graph C



<u>Method 1:</u> Choose an x-value and substitute it into each equation to determine the corresponding y-value. This will give you a coordinate. Look for the graph that goes through this coordinate.

Choose $x = 1$: (Ask why not $x = 0$? Why won't we be able to determine which graph?)

$y = 3x + 3 \Rightarrow y = 3(1) + 3 = 3 + 3 = 6 \quad \therefore (1, 6)$ $\boxed{\text{Graph C}}$

$x + y = 3 \Rightarrow 1 + y = 3$
$\quad -1 \qquad -1$
$y = 2 \quad \therefore (1, 2)$ $\boxed{\text{Graph A}}$

$y = 3x - 3 \Rightarrow y = 3(1) - 3 = 3 - 3 = 0 \quad \therefore (1, 0)$ $\boxed{\text{Graph B}}$

<u>Method 2:</u> Find the y-intercept and the slope from the equation and see which graph has these properties.

$y = 3x + 3 \Rightarrow y = \frac{3}{1}x + 3$ rise 3, run 1, y-int 3 — C

$x + y = 3 \Rightarrow y = 3 - x$ or $y = -\frac{1}{1}x + 3$ drop 1, run 1, y-int 3 — A
$-x \qquad -x$

$y = 3x - 3 \Rightarrow y = \frac{3}{1}x - 3$ rise 3, run 1, y-int -3 — B