Math 8, Unit 1

Day 12: Write Equations in Slope-Intercept Form

Example 1: Write an equation given the *slope* and *y-intercept*:

a. slope = 4, y-intercept = 6

$y = 4x + 6$

You try:

1. Slope is 8; y-intercept is -5.

$y = 8x - 5$

2. Slope is $\frac{2}{3}$; y-intercept is -2.

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

3. Slope is -3; y-intercept is 7.

$y = -3x + 7$

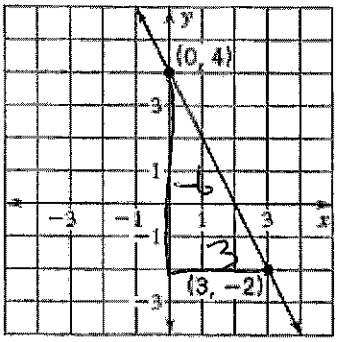
Example 2: Write an equation of a *graph*.

a. Write an equation of the graph: →

$y = -\frac{6}{3}x + 4$

OR

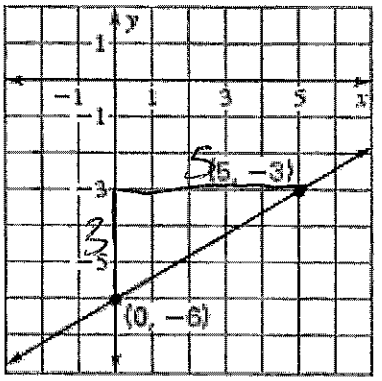
$y = -2x + 4$



You try:

5. Write an equation of the graph: →

$y = \frac{5}{3}x - 6$



Example 3: Write an equation given *slope and 1 point* on the line

a. Write an equation of the line that passes through the point (1, 2) and has a slope of 3.

Work backwards → So (0, -1) b/c 2 − 3 = −1

$y = 3x - 1$

You try:

6. Write an equation of the line that passes through the point (2, 2) and has a slope of 4.

Work backwards twice so → (0, −6) b/c $2 - 4 \cdot 2 = -6$

$y = 4x - 6$

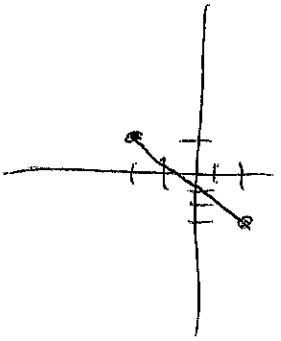
Example 4: Write an equation given *2 points* on the line

a. Write an equation of the line that passes through (2 -3) and (-2, 1).

$m = \frac{1 - -3}{-2 - 2} = \frac{4}{-4} = -1$

$b = -1$

$y = -x - 1$



You try:

7. Write an equation of the line that passes through the points (-8, -13) and (4, 2).

$m = \frac{2 - -13}{4 - -8} = \frac{15}{12} = \frac{5}{4}$

$b = -3$

$y = \frac{5}{4}x - 3$

8. Write an equation of the line that passes the points (-2, 15) and (1, 9).

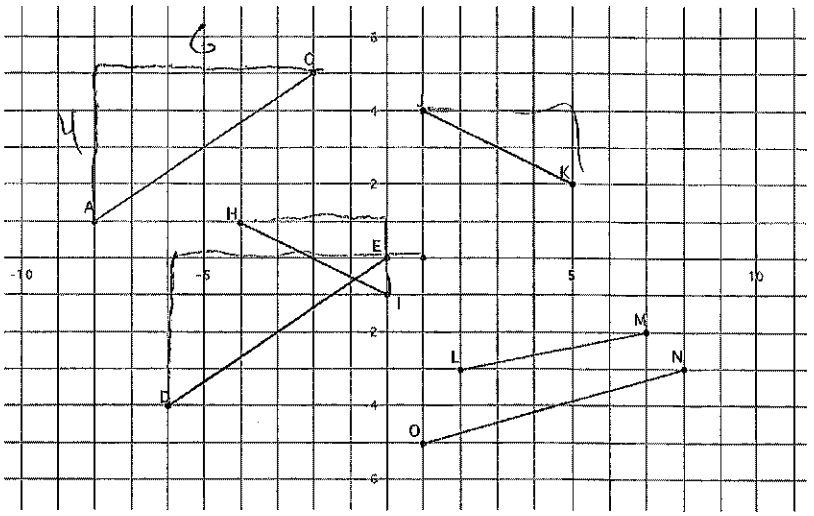
$m = \frac{9 - 15}{1 - -2} = \frac{-6}{3} = -2$

$b = 11$

$y = -2x + 11$

Investigate Parallel and Perpendicular Lines

1. Which line segments to the right *appear* to be **parallel**?



$\overline{AC} \parallel \overline{DE}$

$\overline{HI} \parallel \overline{JK}$

$\overline{LM} \parallel \overline{ON}$

2. Find the slope of $\overline{AC}$, $\overline{DE}$, $\overline{HI}$, $\overline{JK}$.

$\overline{AC} =$ 4/6

$\overline{DE} =$ 4/6

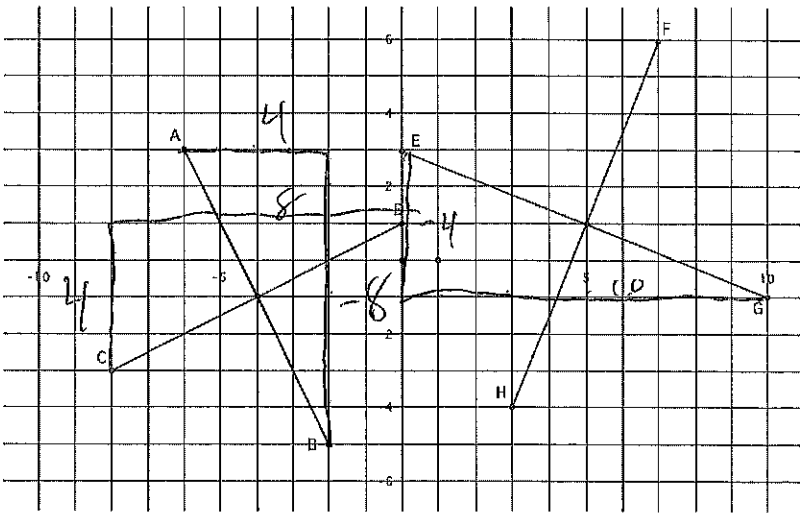
$\overline{HI} =$ -2/4

$\overline{JK} =$ -2/4

3. How do the slopes of the parallel lines compare?

They are equal!

4. Which line segments to the right appear to be **perpendicular**?



$\overline{AB} \perp \overline{CD}$

$\overline{HF} \perp \overline{EG}$

5. Find the slope of each line segment.

$\overline{AB} =$ -8/4

$\overline{CD} =$ 4/8

$\overline{EG} =$ -4/10

$\overline{FH} =$ 10/4

6. How do the slopes of perpendicular lines compare?

Opposite reciprocal

Parallel Lines Property

In a coordinate plane, parallel lines have Same Slope.

Examples: $y = 4x - 7$, $y = 4x + 3$

Perpendicular Lines Property

In a coordinate plane, perpendicular lines have opposite reciprocal

Examples: $y = \frac{1}{2}x - 3$ & $y = -\frac{2}{1}x + 3$

Examples:

1. Write an equation of the line that contains the point (-3, -5) and is **parallel** to the line y = 3x – 1.

$y = 3x + 4$

2. Write an equation of the line that contains the point (4, -5) and is **perpendicular** to the line y = 2x + 3.

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

Now You Try:

3. Write an equation of the line that passes through (4, 3) and is perpendicular to the line y = 4x – 7.

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

4. Write an equation of the line that passes through (8, 2) and is parallel to the line y = -2x + 6

$y = -2x + 18$