Today is 11/1/17

Get out note packet and a calculator

Goal: Write an equation for a line in slope intercept form given specific information

Agenda:	Homework:
Brain Teaser	Writing Equations worksheet
p. 19 & 20	
Start Homework	Quiz Friday!

Slope-Intercept Form

Slope-Intercept Form	$y = mx + b$, where m is the given slope and b is the y-intercept

Example 1 Write an equation of the line whose slope is -4 and whose y-intercept is 3.

$y = mx + b$ Slope-intercept form
$y = -4x + 3$ Replace m with -4 and b with 3.

Example 2 Graph $3x - 4y = 8$.

$3x - 4y = 8$ Original equation

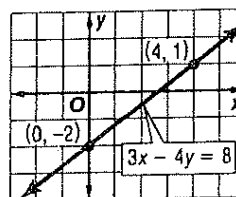$\quad -4y = -3x + 8$ Subtract $3x$ from each side.

$\dfrac{-4y}{-4} = \dfrac{-3x + 8}{-4}$ Divide each side by -4.

$\quad y = \dfrac{3}{4}x - 2$ Simplify.

The y-intercept of $y = \dfrac{3}{4}x - 2$ is -2 and the slope is $\dfrac{3}{4}$. So graph the point $(0, -2)$. From this point, move up 3 units and right 4 units. Draw a line passing through both points.

Write an equation of the line with the given slope and y-intercept.

1. slope: 8, y-intercept -3

$$m \qquad b$$

$$y = 8x - 3$$

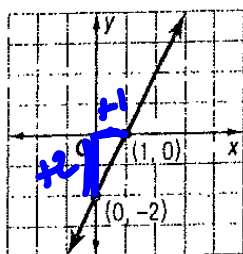2. slope: -2, y-intercept -1

$$m \qquad b$$

$$y = -2x - 1$$

3. slope: -1, y-intercept -7

$$y = -x - 7$$
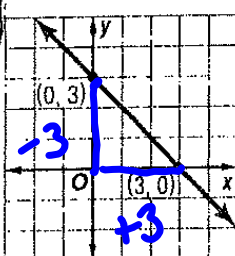
Write an equation of the line shown in each graph.

4.

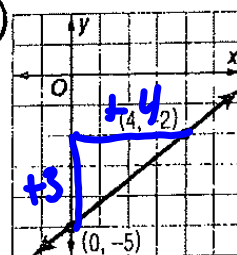$m = \dfrac{2}{1}$

$b = -2$

$y = 2x - 2$

5.

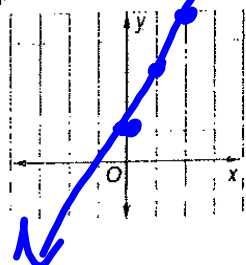$m = \dfrac{-3}{3} = -1$

$b = 3$

$\boxed{y = -x + 3}$

6.

$m = \dfrac{3}{4}$

$b = -5$

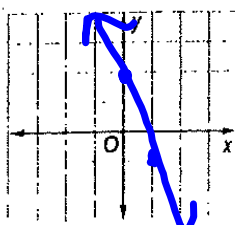$\boxed{y = \dfrac{2}{4}x - 5}$
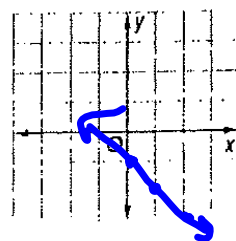
Graph each equation.

7. $y = 2x + 1$

$m = 2$
$b = 1$

8. $y = -3x + 2$

$m = -3$
$b = 2$

9. $y = -x - 1$

$m = -1$
$b = -1$

Example 1 Write an equation of a line that passes through $(-4, 2)$ with slope 3.

The line has slope 3. To find the y-intercept, replace m with 3 and (x, y) with $(-4, 2)$ in the slope-intercept form. Then solve for b.

$y = mx + b$　　　Slope-intercept form

$2 = 3(-4) + b$　　$m = 3, y = 2,$ and $x = -4$

$2 = -12 + b$　　Multiply.

$14 = b$　　Add 12 to each side.

Therefore, the equation is $y = 3x + 14$.

Example 2 Write an equation of the line that passes through $(-2, -1)$ with slope $\frac{1}{4}$.

The line has slope $\frac{1}{4}$. Replace m with $\frac{1}{4}$ and (x, y) with $(-2, -1)$ in the slope-intercept form.
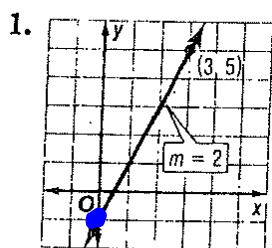
$y = mx + b$　　　Slope-intercept form

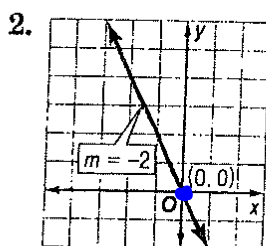$-1 = \frac{1}{4}(-2) + b$　　$m = \frac{1}{4}, y = -1,$ and $x = -2$

$-1 = -\frac{1}{2} + b$　　Multiply.

$-\frac{1}{2} = b$　　Add $\frac{1}{2}$ to each side.

Therefore, the equation is $y = \frac{1}{4}x - \frac{1}{2}$.

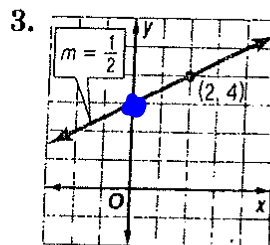Write an equation of the line that passes through each point with the given slope.

1.

(3, 5)

$m = 2$

$b = -1$

$y = 2x - 1$

2.

$m = -2$ (0, 0)

$b = 0$

$y = -2x + 0$

3.

$m = \frac{1}{2}$ (2, 4)

$b = 3$

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

Write an equation of the line that passes through each point with the given slope.

4. $(8, 2)$, $m = -\dfrac{3}{4}$ **5.** $(-1, -3)$, $m = 5$ **6.** $(4, -5)$, $m = -\dfrac{1}{2}$

x y

$y = mx + b$

$2 = -\dfrac{3}{4}(8) + b$

$2 = -6 + b$

$+6 \quad +6$

$8 = b$

$\boxed{y = -\dfrac{3}{4}x + 8}$

x y

$y = mx + b$

$-5 = -\dfrac{1}{2}(4) + b$

$-5 = -2 + b$

$+2 \qquad +2$

$-3 = b$

$\boxed{y = -\dfrac{1}{2}x - 3}$