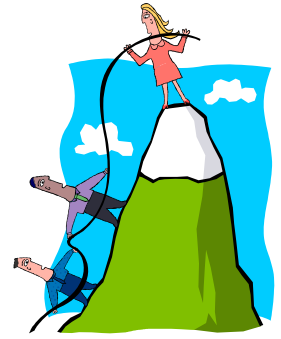


2.3-2.4 Notes – Equations of Lines

Alg 2 Trig G

$$y = mx + b$$



You can write an equation of a line if you are given:

- the slope (m) and the y-intercept (b)
- the slope (m) and the coordinates of 1 point on the line (x, y)
- the coordinates of 2 points on the line (x_2, y_2) (x_1, y_1)

Slope-intercept form:

$$y = mx + b$$

$$m = \text{slope}$$

$$b = \text{y-intercept}$$

Name the slope and y-intercept of the graph of each equation.

1) $y = 6x + 3$
 $m = 6$
 $b = 3$

2) $y = \frac{4}{3}x - 7$
 $m = \frac{4}{3}$
 $b = -7$

3) $y = -8$
 $m = 0$
 $b = -8$

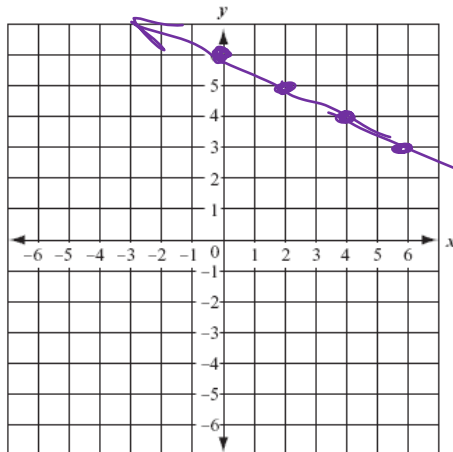
4) $x = 1$
 $m = \text{no slope}$
 $b = \text{none}$

5) $y - 5x = 20$
 $y = 20 + 5x$
 $m = 5$
 $b = 20$

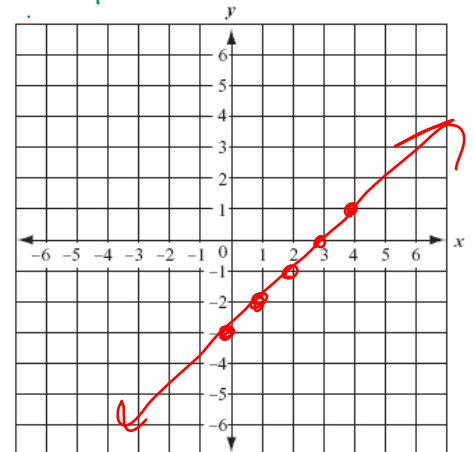
6) $-4y - x = -12$
 $y = 3 - \frac{1}{4}x$
 $m = -\frac{1}{4}$
 $b = 3$

Graph each equation using the slope and y-intercept.

1) $y = -\frac{1}{2}x + 6$
 $b = 6$
 $m = -\frac{1}{2}$



2) $3y + 9 = 3x$
 $3y = 3x - 9$
 $\frac{3y}{3} = \frac{3x}{3} - \frac{9}{3}$
 $y = x - 3$
 $m = 1$
 $b = -3$



$$y = mx + b$$

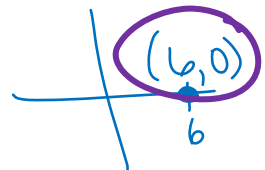
Write the equation in slope-intercept form of the line that satisfies the given conditions.

1) $m = 3, b = -4$

$$y = 3x - 4$$

2) $m = -\frac{2}{5}$, x-intercept = 6

$$(6, 0)$$



$$y = mx + b$$

$$0 = -\frac{2}{5}(6) + b$$

$$0 = -2.4 + b$$

$$2.4 = b$$

$$y = -\frac{2}{5}x + 2.4$$

3) $m = 3$ and passes through $(-4, 6)$

$$y = mx + b$$

$$6 = 3(-4) + b$$

$$6 = -12 + b$$

$$18 = b$$

$$y = 3x + 18$$

same slope

SAME

4) passes through $(-3, 3)$ and $(5, -13)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-13 - 3}{5 - (-3)} = \frac{-16}{8} = -2 = m$$

$$y = mx + b$$

$$3 = -2(-3) + b$$

$$3 = 6 + b$$

$$-3 = b$$

$$y = -2x - 3$$

perp.

5) parallel to the graph of $y = -2x + 3$ and passes through $(5, 10)$

$$m = -2$$

$$y = mx + b$$

$$10 = -2(5) + b$$

$$10 = -10 + b$$

$$20 = b$$

$$y = -2x + 20$$

6) perpendicular to the graph of $y = 4x - 1$ and passes through $(6, -3)$

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

$$y = mx + b$$

$$-3 = -\frac{1}{4}(6) + b$$

$$-3 = -1.5 + b$$

$$-1.5 = b$$

$$y = -\frac{1}{4}x - 1.5$$