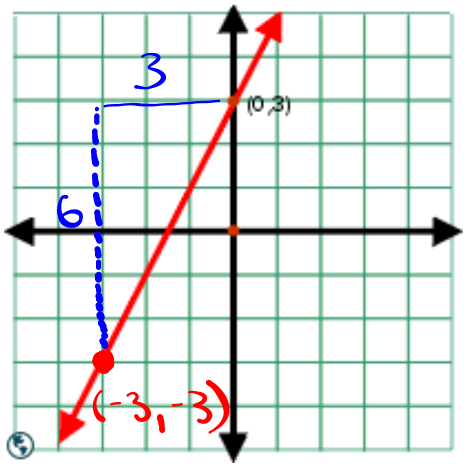
Slope-Intercept Form

$$y = mx + b$$

- m = Slope
- b = y-intercept



y-intercept = 3

b = 3

$m = \frac{\text{rise}}{\text{run}}$

$m = \frac{6}{3}$

$m = 2$

$y = mx + b$

$y = 2x + 3$

$y = mx + b$

What is the slope and y-intercept of each line?

$y = 4x - 9$

$m = 4$

$b = -9$

$y = 4x - 6$

$m = 4$

$b = -6$

$y = -\frac{1}{4}x + 3$

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

$b = 3$

$y = 6x + 1$

$m = 6$

$b = 1$

$y = \frac{1}{4}x - 2$

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

$b = -2$

Which lines are parallel?

$y = 4x - 9$ is parallel to $y = 4x - 6$

(same slope)

Which lines are perpendicular?

$y = -\frac{1}{4}x + 3$ is perpendicular to both

$y = 4x - 9$ and $y = 4x - 6$

(slopes are opposite reciprocals)

1. Find the slope and y-intercept.

$y = 5x + 4$

Slope(m): m=5

y-intercept(b): b=4

2. Find the slope and y-intercept.

$$\frac{2y}{2} = \frac{6x}{2} + \frac{8}{2}$$

$$y = 3x + 4$$

Slope(m): m=3

y-intercept(b): b=4

3. a) Find the slope and y-intercept.

$y + 3 = \frac{1}{2}x + 7$

$-3 \quad -3$

$y = \frac{1}{2}x + 4$

Slope(m): $m = \frac{1}{2}$

y-intercept(b): $b = 4$

b) Find the parallel slope of the equation above.

same

$m \parallel = \frac{1}{2}$

4. a) Find the slope and y-intercept.

$3 - 5x = 3y - 6$ (+6, +6)

$\frac{9}{3} - \frac{5x}{3} = \frac{3y}{3}$

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

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

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

Slope(m): $m = -\frac{5}{3}$

y-intercept(b): $b = 3$

b) Find the perpendicular slope of the equation above.

(opposite reciprocal)

$m_1 = \frac{3}{5}$

4. a) Find the slope and y-intercept. $y = mx + b$

$3 - 5x = 3y - 6$

$-3y = 5x - 3 - 6$

$\frac{-3y}{-3} = \frac{5x}{-3} - \frac{9}{-3}$

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

Slope(m): $m = -\frac{5}{3}$

y-intercept(b): $b = 3$

b) Find the perpendicular slope of the equation above. (opposite reciprocal)

$m_1 = \frac{3}{5}$

(opposite reciprocal)

5. Find the perpendicular slope of the following equation.

$y = mx + b$

$2(y - 4) = 4x - 8$

$m = 2$

$b = 0$

$m\perp = -\frac{1}{2}$

$2y - 8 = 4x - 8$ (+8, +8)

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

$y = 2x$

$\frac{2(y - 4)}{2} = \frac{4x}{2} - \frac{8}{2}$

$y - 4 = 2x - 4$ (+4, +4)

$y = 2x$

(same)

6. State the parallel slope of the equation.

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

$m = 4$ $\quad m\parallel = 4$

$b = -8$

$\cancel{4}\cdot \frac{3y}{\cancel{4}} = 3x - 6 \quad \cdot 4 \quad \cdot 4$

$\frac{3y}{3} = \frac{12x}{3} - \frac{24}{3}$

$y = 4x - 8$

Homework

#1 Fill in the missing information

Slope of line AB	Slope of line CD	Parallel, Perpendicular or Neither
3/2	2/3	Neither
4/6 = 2/3	8/12 = 2/3	Parallel
-5/6	6/5	Perpendicular
3/2	-2/3	Perpendicular
-10/2 = -5	-5	Parallel
3/8	-8/3	Perpendicular
30/2 = 15	-1/15	Perpendicular
-3/5	50/30 = 5/3	Perpendicular
1/4	-1/4	Neither
3/9 = 1/3	1/3	Parallel
5/9	5/9	Parallel

#2 State the slope and the y-int for each of the following:

a) $y = 2/3x - 1$
b) $-y = 5x + 2$
c) $3y = 9x - 27$
d) $8x - 4 = 2y - 2$
e) $3(2y - 1) = 12x + 3$
f) $\frac{1}{2}(y - 1) = 3x + 1$
g) $8x - 1 = 4y - 9$
h) $3/2(2y - 2) = 12x - 6$
i) $-5y = 10x - 20$

a) $y = \frac{2}{3}x - 1$ $m = \frac{2}{3}$ $b = -1$
b) $y = -5x - 2$ $m = -5$ $b = -2$
c) $y = 3x - 9$ $m = 3$ $b = -9$
d) $y = 4x - 1$ $m = 4$ $b = -1$
e) $y = 2x + 1$ $m = 2$ $b = 1$
f) $y = 6x + 3$ $m = 6$ $b = 3$
g) $y = 2x + 2$ $m = 2$ $b = 2$
h) $y = 4x - 1$ $m = 4$ $b = -1$
i) $y = -2x + 4$ $m = -2$ $b = 4$

State the slope parallel to $y = 5x - 3$.

State the slope perpendicular to y =4/5x -3

State the slope parallel to $y = -8x + 7$

Graph the following:

$2y = 6x + 8$

$3 - 5x = 3y - 6$