

Slope-Intercept Form:  $y = mx + b$   
 $m = \underline{\hspace{2cm}}$   $b = \underline{\hspace{2cm}}$

### Parallel Lines

Graph the following equations:

$$y = 2x + 3$$

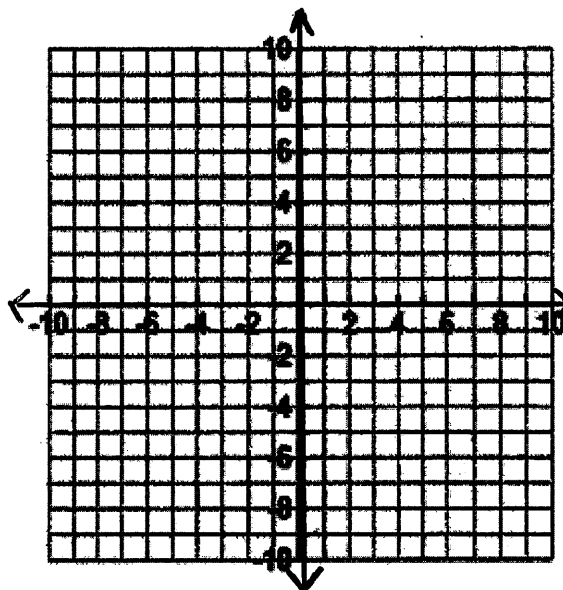
$m = \underline{\hspace{2cm}}$   $b = \underline{\hspace{2cm}}$

$$y = 2x - 4$$

$m = \underline{\hspace{2cm}}$   $b = \underline{\hspace{2cm}}$

What do you notice about their slopes?

What do you notice about their y-intercepts?



### Perpendicular Lines

Graph the following equations:

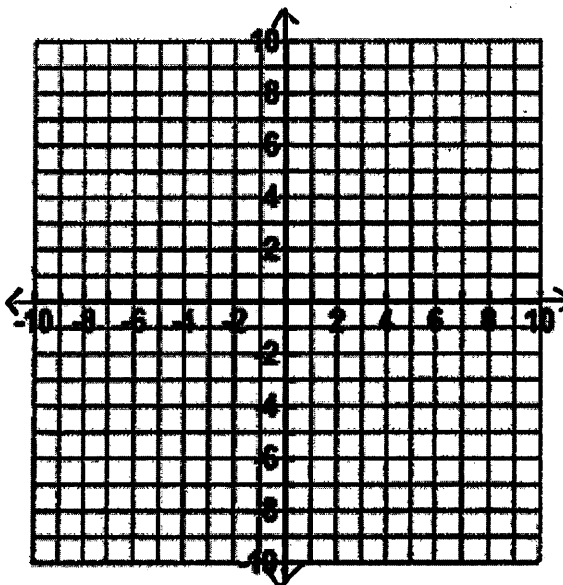
$$y = -2x - 6$$

$m = \underline{\hspace{2cm}}$   $y = \underline{\hspace{2cm}}$

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

$m = \underline{\hspace{2cm}}$   $y = \underline{\hspace{2cm}}$

What do you notice about their slopes?



Perpendicular Slopes are  $\underline{\hspace{4cm}}$

What is the opposite reciprocal of the following numbers?

a) 3

b)  $\frac{1}{4}$

c) -5

d)  $-\frac{7}{9}$

Steps: 1) Write equation in slope-intercept form:  $y = mx + b$   $m$  = slope,  $b$  = y-intercept

2) The slope of a parallel line will be the same slope as the equation's slope

3) The slope of a perpendicular line will be the opposite reciprocal of the equation's slope

**Find the slope of a line parallel to each given line.**

1)  $-2x - 8y = -24$

2)  $-\frac{1}{3}y = -1 - \frac{1}{12}x$

3)  $2 - y = -x$

4)  $-\frac{10}{3} = -2x + \frac{2}{3}y$

5)  $-3y - x = 9$

**Find the slope of a line perpendicular to each given line.**

6)  $-27x = -60 - 15y$

7)  $4x - 3y = 12$

8)  $-5 + 5y - 3x = 0$

9)  $1 = 4x + y$

10)  $-5 = x$

key

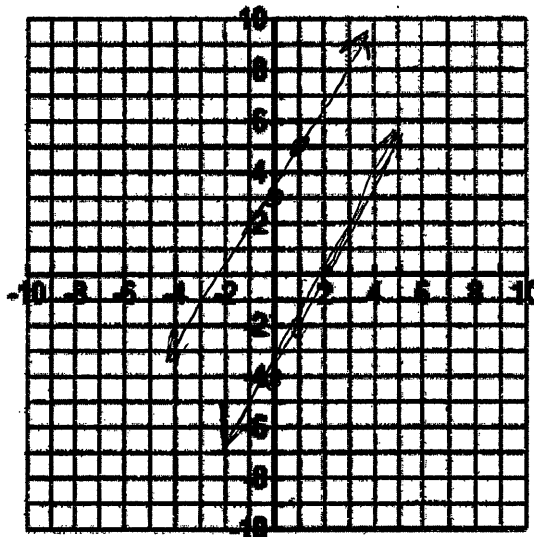
Slope-Intercept Form:  $y = mx + b$   
 $m = \underline{\text{slope}}$   $b = \underline{\text{y-intercept}}$

### Parallel Lines

Graph the following equations:

$y = 2x + 3$   
 $m = \underline{2}$   $b = \underline{3}$   $\frac{2}{1}$  rise  
run

$y = 2x - 4$   
 $m = \underline{2}$   $b = \underline{-4}$



What do you notice about their slopes?

same slope

What do you notice about their y-intercepts?

different y-int. (parallel lines)

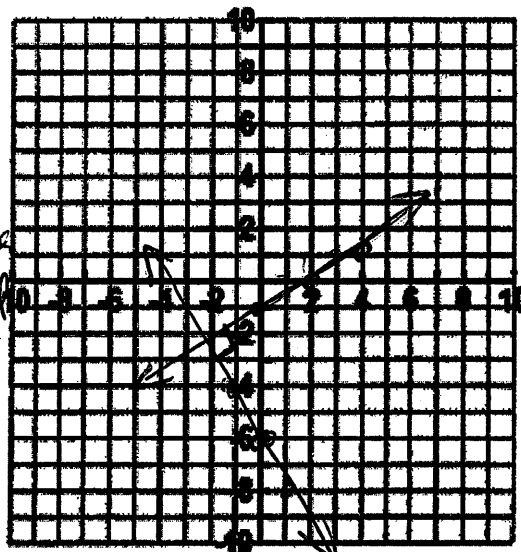
### Perpendicular Lines

Graph the following equations:

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

$y = \frac{1}{2}x - 1$   
 $m = \underline{\frac{1}{2}}$   $b = \underline{-1}$   $\frac{1}{2}$

opposite reciprocals



What do you notice about their slopes?

Perpendicular Slopes are opposite reciprocals of each other

What is the opposite reciprocal of the following numbers?

$m_1 = 3$  a) 3

$m_2 = \underline{-\frac{1}{3}}$

$m_1 = \frac{1}{4}$  b)  $\frac{1}{4}$

$m_2 = \underline{-4}$

$m_1 = -5$  c) -5

$m_2 = \underline{\frac{1}{5}}$

$m_1 = -\frac{7}{9}$  d)  $-\frac{7}{9}$

$m_2 = \underline{\frac{9}{7}}$

Steps: 1) Write equation in slope-intercept form:  $y = mx + b$   $m$  = slope,  $b$  = y-intercept

2) The slope of a parallel line will be the same slope as the equation's slope

3) The slope of a perpendicular line will be the opposite reciprocal of the equation's slope

**Find the slope of a line parallel to each given line.**

1)  $-2x - 8y = -24$   
 $-8y = 2x - 24$   
 $\frac{-8y}{-8} = \frac{2x}{-8} - \frac{24}{-8}$   
 $y = -\frac{1}{4}x + 3$   
 $m = -\frac{1}{4}$

2)  $-\frac{1}{3}y = -1 - \frac{1}{12}x$   
 $y = 3[-1 - \frac{1}{12}x]$   
 $y = -\frac{3}{12}x + 3$   
 $y = -\frac{1}{4}x + 3$   
 $m = \frac{1}{4}$

3)  $2 - y = -x$   
 $2 + x = y$   
 $y = x + 2$   
 $m = 1$

4)  $-\frac{10}{3} = -2x + \frac{2}{3}y$   
 $\frac{3}{2}(\frac{2}{3}y = 2x - \frac{10}{3})$   
 $y = 3x - 5$   
 $m = 3$

5)  $-3y - x = 9$   
 $-3y = x + 9$   
 $y = -\frac{1}{3}x - 3$   
 $m = -\frac{1}{3}$

**Find the slope of a line perpendicular to each given line.**

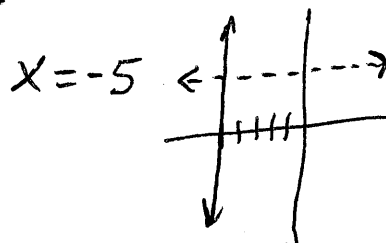
6)  $-27x = -60 - 15y$   
 $15y = 27x - 60$   
 $y = \frac{27}{15}x - 4$   
 $y = \frac{9}{5}x - 4$   
 $m_1 = \frac{9}{5}$   
 $m_2 = -\frac{5}{9}$

7)  $4x - 3y = 12$   
 $-3y = -4x + 12$   
 $y = \frac{4}{3}x - 4$   
 $m_1 = \frac{4}{3}$   
 $m_2 = -\frac{3}{4}$

8)  $-5 + 5y - 3x = 0$   
 $5y = 3x + 5$   
 $y = \frac{3}{5}x + 1$   
 $m_1 = \frac{3}{5}$   
 $m_2 = -\frac{5}{3}$

9)  $1 = 4x + y$   
 $y = -4x + 1$   
 $m_1 = -4 = -\frac{4}{1}$   
 $m_2 = \frac{1}{4}$

10)  $-5 = x$



$m_1 = \text{undefined}$

$m_2 = 0$