

## 2.4 More on Slopes

### GOALS:

1. Understand parallel lines:
  - 2 lines that never intersect
  - slopes are equal
2. Understand perpendicular Lines:
  - 2 lines that intersect at  $90^\circ$  angles
  - slopes are negative reciprocals
3. Find equations of parallel and perpendicular lines.

Study 2.4 CVC # 1-5, # 1-15; 19 - 25

### two linear equations:

url: [http://www.battaly.com/collegealgebra/geogebra/system\\_2lines/](http://www.battaly.com/collegealgebra/geogebra/system_2lines/)

VIDEO geogebra, interactive: slope-intercept form,  $y = mx + b$   
<http://www.battaly.com/collegealgebra/geogebra/slopeIntercept/>

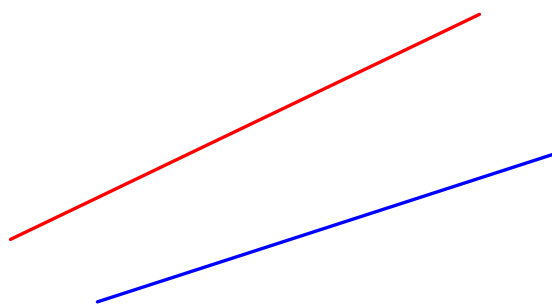
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## 2.4 More on Slopes

Consider 2 lines.  
How can they relate to each other?



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Consider 2 lines.  
How can they relate to each other?

lines $l_1, l_2$	$y = mx + b$ slope, m	example
parallel $l_1 \parallel l_2$	$m_1 = m_2$	$y = 2x + 4$ $y = 2x - 3$
perpendicular $l_1 \perp l_2$	$m_1 = \frac{-1}{m_2}$	$y = 2x + 4$ $y = (-1/2)x + 4$

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G: (-2, -7), parallel to  $y = -5x + 4$  F: equation of line

1. Get m from given line.
2. Use given point
3. Substitute in pt-slope form.

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G:  $(-2, -7)$ , parallel to  $y = -5x + 4$       F: equation of line

$m = -5$  *ke. parallel.*

$y - y_1 = m(x - x_1)$   
 $y - (-7) = -5(x - (-2))$   
 $y + 7 = -5(x + 2)$   
 $y + 7 = -5x - 10$   
 $\begin{array}{r} y + 7 = -5x - 10 \\ -7 = \quad -10 \\ \hline y = -5x - 17 \end{array}$

$y = mx + b$   
 $y - y_1 = m(x - x_1)$

10/25/14

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G:  $(5, -9)$ , perpendicular to  $x + 7y - 12 = 0$

F: equation of line

1. Get m from given line.
2. Use given point
3. Substitute in pt-slope form.

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G: (5, -9), perpendicular to  $x + 7y - 12 = 0$   
 F: equation of line

$l:$

$x + 7y - 12 = 0$   
 $7y = -x + 12$   
 $y = -\frac{1}{7}x + \frac{12}{7}$   
 $m_1 = +7$   
 $m_2 = -\frac{1}{7}$

$y = mx + b$   
 $y - y_1 = m(x - x_1)$   
 $y - (-9) = m(x - 5)$   
 $m = -\frac{1}{m_1} = -\frac{1}{7}$

$y + 9 = -\frac{1}{7}(x - 5) = -\frac{1}{7}x + \frac{5}{7}$   
 $y = -\frac{1}{7}x + \frac{5}{7} - 9 = -\frac{1}{7}x - \frac{58}{7}$

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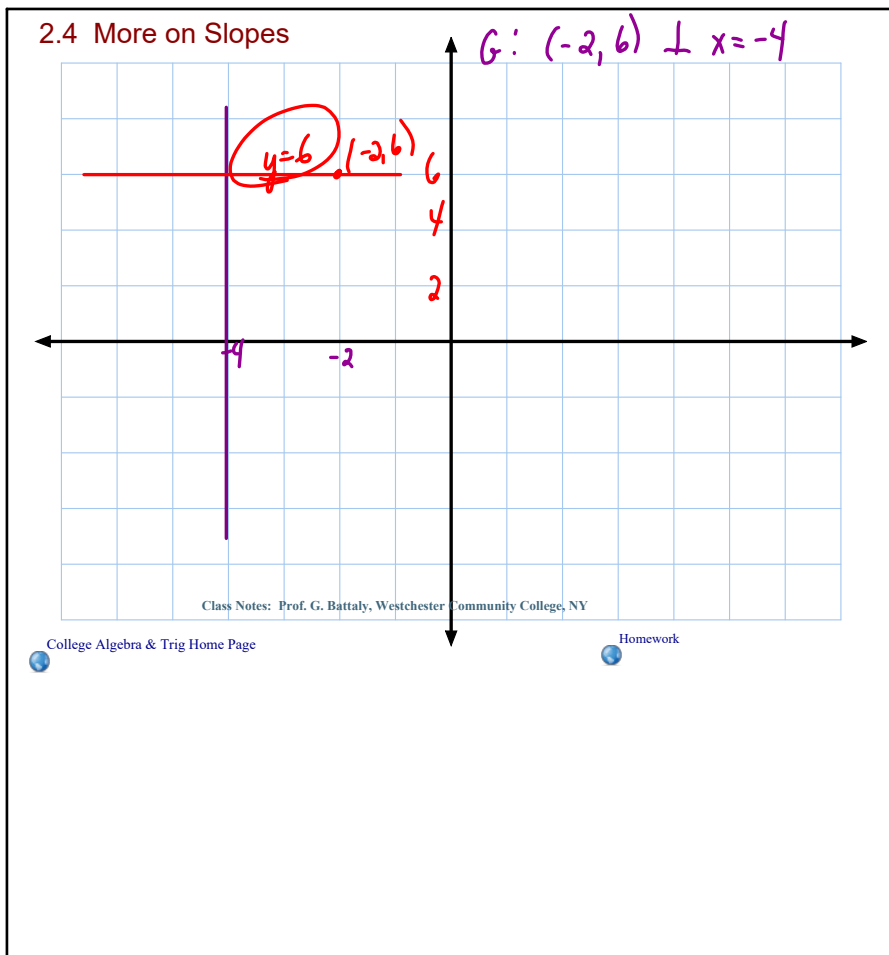
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G: (-2, 6)  $\perp$   $x = -4$

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2.4 More on Slopes

G:  $(-1, 3)$ , perpendicular to  $3x - 2y - 5 = 0$   
 F: equation of line

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G: (-1, 3), parallel to  $3x - 2y - 5 = 0$   
 F: equation of line

$$\frac{-2y}{-2} = \frac{-3x + 5}{-2}$$

$$y = \frac{3}{2}x - \frac{5}{2}$$

$$m = \frac{3}{2}$$

eg. line

$$y = mx + b$$

$$y - y_1 = m(x - x_1)$$

$$y - 3 = m(x - (-1))$$

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

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

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

$$2y - 6 = 3x + 3$$

$$-3x + 2y - 9 = 0$$

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## Attachments

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slope\_intercept.mp4