

## Today's Plan:

**Learning Target (standard):** I will determine whether or not two lines are parallel or perpendicular to one another. I will write the equations for parallel and perpendicular lines.

**Students will:** Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

**Teacher will:** Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

**Assessment:** Board work, homework check and homework assignment

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

### Bell Ringer:

Describe whether the two equations are parallel or perpendicular to one another. How do you know? Provide support for your choice. Describe one situation in your life where you may encounter parallel or perpendicular lines.

$$3x + 4y = 8$$

$$4y = -3x + 8$$

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

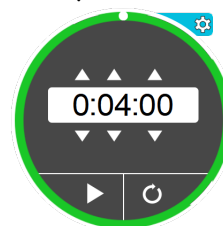
$$m_1 = -\frac{3}{4}$$

$$4x - 3y = 9$$

$$-3y = -4x + 9$$

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

$$m_2 = \frac{4}{3}$$



$\therefore$  The lines are perpendicular because their slopes are opposite reciprocals of one another.

$$m_1 = -\frac{1}{m_2}$$

6) Find the equation for the line perpendicular to the given and passing through the indicated point.

~~$y = \frac{2}{7}x + 2$~~   $m = \frac{2}{7}$

passes through  $(-2, 4)$

$m_{\perp} = -\frac{7}{2}$

① slope-intercept

$y = mx + b$

$4 = -\frac{7}{2}(-2) + b$

$4 = 7 + b$

$b = -3$

$y = -\frac{7}{2}x - 3$

② standard

$y = -\frac{7}{2}x - 3$

$2 \left[ \frac{7}{2}x + y = -3 \right]$

$7x + 2y = -6$

Find the equation for the line parallel to the given and passing through the indicated point.

$4x + 3y = 12$

passes through  $(-6, 4)$

$m_{//} = -\frac{4}{3}$

$\frac{3y}{3} = \frac{-4x + 12}{3}$

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

$m = -\frac{4}{3}$

① slope-intercept

$y = mx + b$

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

$4 = 8 + b$

$-4 = b$

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

② standard

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

$3 \left[ \frac{4}{3}x + y = -4 \right]$

$4x + 3y = -12$

Find the equation for the line perpendicular to the given and passing through the indicated point.

$$3x - 4y = 12$$

passes through  $(-3, 2)$

$$m_{\perp} = -\frac{4}{3}$$

① slope-intercept

$$y = mx + b$$

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

$$2 = 4 + b$$

$$b = -2$$

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

$$\frac{-4y}{-4} = \frac{-3x + 12}{-4}$$

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

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

② standard

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

$$3 \left[ \frac{4}{3}x + y = -2 \right]$$

$$4x + 3y = -6$$

Write the slope-intercept form of an equation of the line that passes through the given point and is parallel to the graph of each equation.

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

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

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

① slope-intercept

$$y = mx + b$$

$$-1 = \frac{1}{2}(1) + b$$

$$2 \left[ -1 = \frac{1}{2} + b \right]$$

$$-2 = 1 + 2b$$

$$-3 = 2b$$

$$b = -\frac{3}{2}$$

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

Write the slope-intercept form of an equation of the line that passes through the given point and is perpendicular to the graph of each equation.

$(6, -2)$   $y = \frac{3}{2}x + 1$   $m = \frac{3}{2}$   $m_{\perp} = -\frac{2}{3}$

$$y = mx + b$$

$$-2 = -\frac{2}{3}(6) + b$$

$$-2 = -4 + b$$

$$b = 2$$

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

Write the slope-intercept and standard form of an equation of the line that passes through the given point and is parallel to the graph of each equation.

$(4, 5)$   $3x + 2y = -9$   $m = -\frac{3}{2}$   $\frac{2y}{2} = \frac{-3x-9}{2}$

① slope-intercept  $y = -\frac{3}{2}x - \frac{9}{2}$   $m = -\frac{3}{2}$

$$y = mx + b$$

$$5 = -\frac{3}{2}(4) + b$$

$$5 = -6 + b$$

$$b = 11$$

$$y = -\frac{3}{2}x + 11$$

② standard  $y = -\frac{3}{2}x + 11$

$$2 \left[ \frac{3}{2}x + y = 11 \right]$$

$$3x + 2y = 22$$

Write the slope-intercept and standard form of an equation of the line that passes through the given point and is perpendicular to the graph of each equation.

$$(3, 4); 2x - 5y = 10$$

$$m_{\perp} = -\frac{5}{2} \quad \frac{-5y}{-5} = \frac{-2x+10}{-5}$$

① slope-intercept  $y = \frac{2}{5}x - 2$   
 $y = mx + b$   $m = \frac{2}{5}$

$$4 = -\frac{5}{2}(3) + b$$

$$2 \left[ 4 = -\frac{15}{2} + b \right]$$

$$8 = -15 + 2b$$

$$23 = 2b$$

$$b = \frac{23}{2}$$

$$y = -\frac{5}{2}x + \frac{23}{2}$$

② standard

$$y = -\frac{5}{2}x + \frac{23}{2}$$

$$2 \left[ \frac{5}{2}x + y = \frac{23}{2} \right]$$

$$5x + 2y = 23$$

## Assignment:

### Equations for Lines 3

#1-16

\* slope-intercept  
and standard

\* Write formulas & show ALL work \*

\* QUIZ Tuesday \*