Today's Plan:

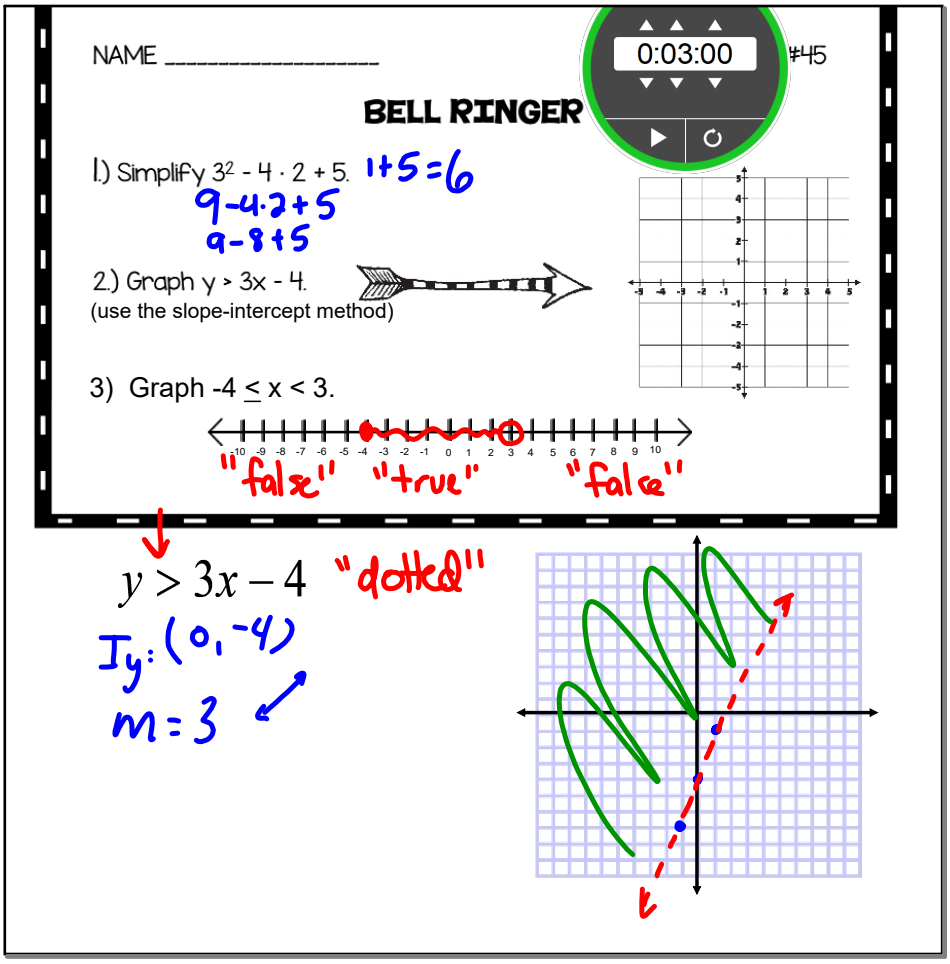
Learning Target (standard): I will determine whether or not two lines are parallel or perpendicular to one another. I will write the equations for parallel and perpendicular lines.

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.



Write the slope-intercept and standard form of the line described.

5) through (5,3) & parallel to $y = \frac{1}{5}x + 3$

$m = \frac{1}{5}$

$m_{\parallel} = \frac{1}{5}$

① Slope-intercept

$y = mx + b$

$3 = \frac{1}{5}(5) + b$

$3 = 1 + b$

$b = 2$

$y = \frac{1}{5}x + 2$

② Standard

$y = \frac{1}{5}x + 2$

-5

$-\frac{1}{5}x + y = 2$

$x - 5y = -10$

Write the slope-intercept and standard form of the line described.

12) through (-3,5) & perpendicular to $y = 3x - 3$

$m = 3$

$m_{\perp} = -\frac{1}{3}$

① Slope-intercept

$y = mx + b$

$5 = -\frac{1}{3}(-3) + b$

$5 = 1 + b$

$b = 4$

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

② Standard

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

3

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

$x + 3y = 12$

Graph using the slope-intercept method.

$$2x+5y=-10$$

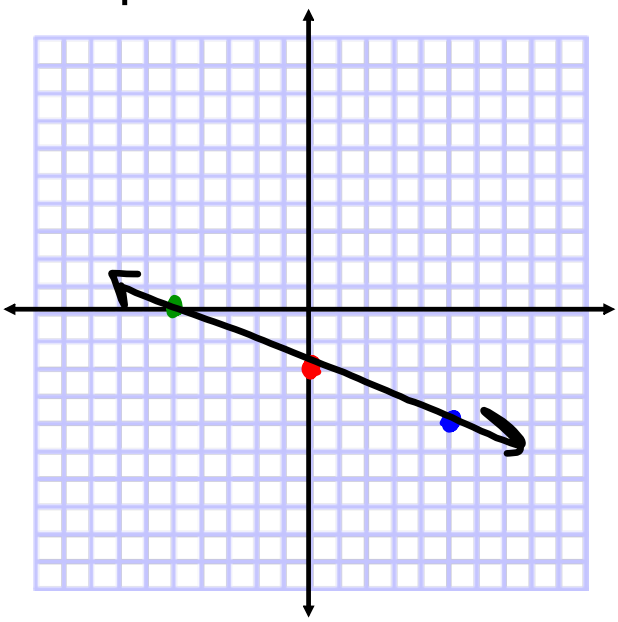
$-2x$ $-2x$

$\frac{5y}{5}=\frac{-2x}{5}-\frac{10}{5}$

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

$m=-\frac{2}{5}$

$I_y: (0,-2)$



Are the two lines parallel? Why?

$$2x-4y=8$$

$-2x$ $-2x$

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

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

$m_1=\frac{1}{2}$

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

$+3x$ $+3x$

$\frac{6y}{6}=\frac{3x}{6}+\frac{6}{6}$

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

$m_2=\frac{1}{2}$

∴ The lines are parallel because they have same slopes ($m_1=m_2$).

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

$2x - 5y = 10$

passes through (-2,4)

$-5y = 2x + 10$

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

$m = -\frac{2}{5}$

$m_\perp = \frac{5}{2}$

① Slope-intercept

$y = mx + b$

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

$4 = -5 + b$

$b = 9$

$y = \frac{5}{2}x + 9$

② Standard

$y = \frac{5}{2}x + 9$

$-2\left[-\frac{5}{2}x + y = 9\right]$

$5x - 2y = -18$

Find the equation of the line that passes through the given points:

(-3,2) and (-1,5)

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{5-2}{-1+3}$

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

① $y = mx + b$

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

$2 = -\frac{9}{2} + b$

$2 + \frac{9}{2} = b$

$\frac{4}{2} + \frac{9}{2} = b$

$b = \frac{13}{2}$

$5 = \frac{3}{2}(-1) + b$

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

$\frac{13}{2} = b$

Slope-intercept

$y = \frac{3}{2}x + \frac{13}{2}$

② $-2\left(y = \frac{3}{2}x + \frac{13}{2}\right)$

$-2y = 3x - 13$

$3x - 2y = -13$ standard

Graph using the slope-intercept method.

$$-6x+3y=12$$

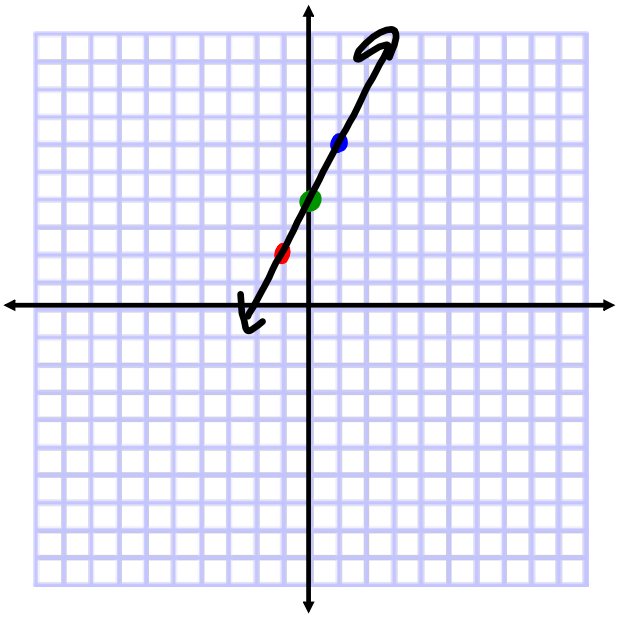
$+6x \qquad +6x$

$$\frac{3y}{3}=\frac{6x}{3}+\frac{12}{3}$$

$$y=2x+4$$

$m=2$

$I_y: (0,4)$



Are the two lines perpendicular? Why?

$(1,2)\ \&\ (-2,2)$

$$m_1=\frac{y_2-y_1}{x_2-x_1}$$

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

$$=\frac{0}{-3}$$

$m_1=0$

$(-3,4)\ \&\ (-3,5)$

$$m_2=\frac{y_2-y_1}{x_2-x_1}$$

$$=\frac{5-4}{-3+3}$$

$$=\frac{1}{0}$$

$m_2=$ und

$\therefore$ The lines are perpendicular because $m_1=-\frac{1}{m_2}$.

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

$-2x+3y=9$

passes through (-6,2)

$m_{//}=\frac{2}{3}$

$\frac{3y}{3}=\frac{2x}{3}+\frac{9}{3}$

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

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

① $y=mx+b$

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

$2=-4+b$

$b=6$

$y=\frac{2}{3}x+6$

② $-3\left(y=\frac{2}{3}x+6\right)$

$-3y=-2x-18$

$2x-3y=18$

Assignment:

Paralle & Perpendicular Lines Practice

#1-8