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.
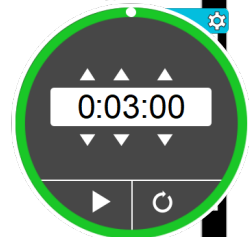
Assessment: Board work, homework check and homework assignment

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.

NAME _____   #47

BELL RINGER

0:03:00

1.) Write 55% as a decimal and fraction in simplest form.

$$\frac{55 \div 5}{100} = \frac{11}{20} \qquad = 0.55$$

2.) Is (4, –3) a solution to the equation y = 2x - 11?

$$-3 = 2(4) - 11$$
$$-3 = 8 - 11$$
$$-3 = -3 \checkmark$$

yes

3.) Simplify 5 - 3(4 - 1) + 2.
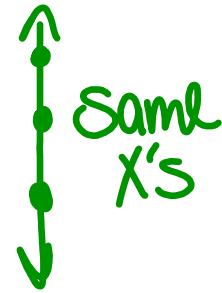
$$5 - 3(3) + 2$$
$$5 - 9 + 2$$
$$-4 + 2$$
$$\boxed{-2}$$

Write the equation of the line in slope-intercept form.

8) passes through (0,5) & (0,2)

① $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{2-5}{0-0} = \dfrac{-3}{0}$ ← special case

$$\boxed{X = 0}$$

$m = \dfrac{rise}{run} = \dfrac{\checkmark}{no}$

same X's

Write the equation of the line in slope-intercept form.

10) through (4,-3) & parallel to $y = \dfrac{1}{4}x - 2$

$M_{//} = \dfrac{1}{4}$ $m = \dfrac{1}{4}$

① slope-intercept
$y = mx + b$
$-3 = \dfrac{1}{4}(4) + b$
$-3 = 1 + b$
$b = -4$
$$\boxed{y = \dfrac{1}{4}x - 4}$$

② standard
$y = \dfrac{1}{4}x - 4$
$-4\;\boxed{-\dfrac{1}{4}x + y = -4}$
$$\boxed{X - 4y = 16}$$

Write the equation of the line in slope-intercept form.

16) through (-4,2) & perpendicular to $y = \frac{4}{3}x - 3$

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

① slope-intercept
$$y = mx + b$$
$$2 = \frac{3}{4}(-4) + b$$
$$2 = -3 + b$$
$$b = 5$$
$$\boxed{y = \frac{3}{4}x + 5}$$

③ standard
$$y = \frac{3}{4}x + 5$$
$$-4\left[-\frac{3}{4}x + y = 5\right]$$
$$\boxed{3x - 4y = -20}$$

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

(5,4) and (-3,7)

① $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-4}{-3-5} = \frac{3}{-8}$ $m = -\frac{3}{8}$

② Slope-intercept:
$$y = mx + b$$
$$4 = -\frac{3}{8}(5) + b$$
$$4 = -\frac{15}{8} + b$$
$$4 + \frac{15}{8} = b$$
$$\frac{32}{8} + \frac{15}{8} = b$$
$$b = \frac{47}{8}$$

$$\boxed{y = -\frac{3}{8}x + \frac{47}{8}}$$

③ Standard form:
$$8\left[y = -\frac{3}{8}x + \frac{47}{8}\right]$$
$$8y = -3x + 47$$
$$\boxed{3x + 8y = 47}$$

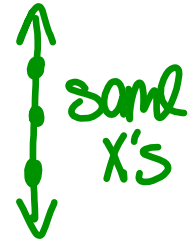Find the equation of the line that passes through the given points:

(-3,4) and (-3,7)

① $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{7-4}{-3+3} = \dfrac{3}{0}$ ← special case

$\boxed{x = -3}$

$m = \dfrac{rise}{run} = \dfrac{\checkmark}{no}$

same X's

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

$4x + 3y = 9$

passes through (9,-4)

$m_{\parallel} = -\dfrac{4}{3}$

① $3y = -4x + 9$

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

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

② slope-intercept
$y = mx + b$
$-4 = -\dfrac{4}{3}(9) + b$
$-4 = -12 + b$
$\underline{b = 8}$
$\boxed{y = -\dfrac{4}{3}x + 8}$

③ standard
$y = -\dfrac{4}{3}x + 8$
$3\left[\dfrac{4}{3}x + y = 8\right]$
$\boxed{4x + 3y = 24}$

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

$$3x + 4y = 12$$

passes through (-3,4)

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

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

$$y = mx + b$$
$$4 = \frac{4}{3}(-3) + b$$
$$4 = -4 + b$$
$$b = 8$$

Slope-intercept:
$$y = \frac{4}{3}x + 8$$

Standard form:
$$-3\left[y = \frac{4}{3}x + 8\right]$$
$$-3y = 4x - 24$$
$$4x - 3y = 24$$

Are the two lines parallel? Why?

$$2x - 4y = 8$$
$$-2x \qquad -2x$$

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

$$y = \frac{1}{2}x - 2$$
$$m_1 = \frac{1}{2}$$

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

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

$$y = \frac{1}{2}x + 1$$
$$m_2 = \frac{1}{2}$$

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

Are the two lines perpendicular? Why?

$$(1,2) \& (-2,-4) \qquad\qquad (-3,4) \& (4,5)$$

$$M = \frac{y_2 - y_1}{x_2 - x_1} \qquad\qquad M = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-4-2}{-2-1} \qquad\qquad = \frac{5-4}{4+3}$$

$$= \frac{-6}{-3} \qquad\qquad m_2 = \frac{1}{7}$$

$$m_1 = 2$$

∴ The lines are **not** perpendicular because the slopes are not opposite reciprocals $\left(m_1 \neq -\frac{1}{m_2}\right).$

Assignment: * QUIZ Monday *

Writing Equations for Lines Post-Assessment

* This is an Edulastic assignment that will be completed on paper as well and graded for accuracy. *