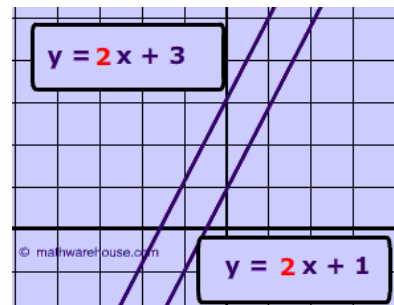UNIT 2 LESSON 6 – PARALLEL AND PERPENDICULAR LINES

PARALLEL LINES

**Have the <u>same slope</u>

**Need the <u>same slope</u>, and a <u>given point</u>
to write the new equation

**If the given equation is NOT in slope-intercept form,
<u>YOU MUST REWRITE THE EQUATION</u>!!

PERPENDICULAR LINES

** Have opposite reciprocal <u>slopes</u>
(opposite means "opposite sign")

**Need the <u>new slope</u>, and a <u>given point</u>
to write the new equation

**If the given equation is NOT in slope-intercept form,
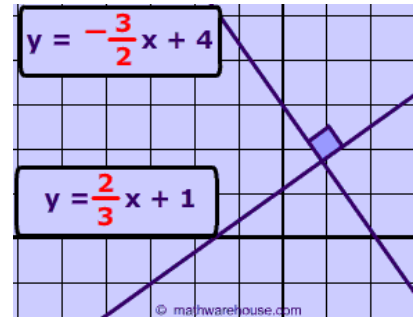<u>YOU MUST REWRITE THE EQUATION</u>!!

Example 1) Write the slope-intercept form of an equation for the line that passes through the point (4, 7) and is parallel to the graph of $y = 3x + 6$.

Step 1) Is the equation in "y= mx + b" format?   YES

Step 2) Identify whether it ask for parallel or perpendicular   PARALLEL – which means we will use the same slope from the given equation

Step 3) Identify the slope and the given point   m = 3, point given (4, 7)

Step 4) Plug into the slope-intercept form   y = mx + b
$$7 = 3(4) + b$$

Step 5) Solve for y $7 = 3(4) + b$
$$7 = 12 + b$$
$$-5 = b$$

New Equation $y = 3x - 5$

Example 2) Write the slope-intercept form of an equation for the line that passes through the point (−9, −2) and is perpendicular to the graph of

3y − 9x = − 18.

Step 1) Is the equation in "y= mx + b" format?   NO – so we must solve for y

y = 3x − 6

Step 2) Identify whether it ask for parallel or perpendicular   PERPENDICULAR – which means we will use the opposite reciprocal slope

Step 3) Identify the slope and the given point   OLD SLOPE = M = 3   NEW SLOPE = M = $-\dfrac{1}{3}$

Given point (−9, −2)

Step 4) Plug into the slope-intercept form   y = mx + b

$-2 = -\dfrac{1}{3}(-9) + b$

Step 5) Solve for y   −2 = 3 + b

−5 = b

New Equation $y = -\dfrac{1}{3}x - 5$

YOU TRY!!!

Example 3) Write the slope-intercept form of an equation for the line
that passes through the point (1, 7) and is parallel to the graph of y = 6x - 1.

Example 4) Write the slope-intercept form of an equation for the line
that passes through the point (−2, 5) and is parallel to the graph of 2y = 4x − 6.

Example 5) Write the slope-intercept form of an equation for the line
that passes through the point (−4, −1) and is perpendicular to the graph of
$y = \dfrac{4}{3}x + 6$

Example 6) Write the slope-intercept form of an equation for the line
that passes through the point (−4, −3) and is perpendicular to the
graph of 8x + 2y = 14.