Section 6.5 –Equation of a Line Given Slope and Point

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DO IT NOW!

Instructions: Determine the equation of the line, in slope y-intercept form, that has a slope of 3 and goes through the point (2, -5)

Note: You can write the equation of a line once you know the slope and y-intercept.

$$y = mx + b$$

Slope **y-intercept**

Step 1: State what you know about the line

Step 2: Determine the y-intercept of the line

To do this we can use the equation $y = mx + b$, substitute in values for m, x and y and then solve for the b value. Use the point on the line that is given for the x and y values.

STEP 3: Write the equation of the line in slope y-intercept form.

Note: When writing the final equation of the line, plug in values for m and b, not for x and y.

Example 1: Find the equation of the line with a slope of $\frac{1}{2}$ that passes through (1, 5).

Step 1: State what you know about the line

Step 2: Determine the y-intercept of the line

STEP 3: Write the equation of the line in slope y-intercept form.

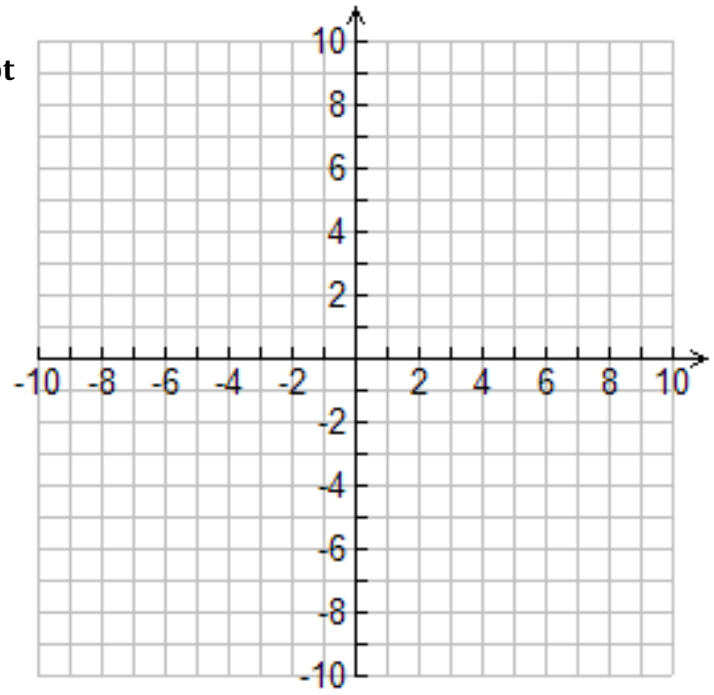
Example 2: Find the equation of the line with a slope of 3 and that passes through (0, 2). Then graph the line.

Step 1: State what you know about the line

Step 2: Determine the y-intercept of the line

STEP 3: Write the equation of the line in slope y-intercept form.

Step 4: Graph the line using the slope and y-intercept



Example 3: Determine the equation of a line that is parallel to the line y = -2x – 7 and passes through the point (1, -3).

Step 1: State what you know about the line

Remember: lines that are parallel have the same slope. They do not have the same y-intercept. You will still have to solve for that.

Step 2: Determine the y-intercept of the line

STEP 3: Write the equation of the line in slope y-intercept form.

Example 4: Determine the equation of a line that is perpendicular to the line $2x - y + 4 = 0$ and passes through the point (-2, 5).

Hint: to determine the slope you will need to put the equation into y=mx+b form so that you can see the slope and then take the negative reciprocal.

STEP 1: state what you know about the line

Slope of given line:

Slope of perpendicular line (find negative reciprocal):

Point on the perpendicular line:

Step 2: Determine the y-intercept of the line (make sure to use the slope of the perpendicular line)

STEP 3: STEP 3: Write the equation of the line in slope y-intercept form (make sure to use the slope of the perpendicular line).

Consolidation:

To write the equation of a line you need to know the _____ and _____.

You can use the slope of a line and a point on the line to calculate the _____.

To find the slope of a perpendicular line, find the _____.