

Section 6.6 –Equation of a Line Given Two Points

MPM1D

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

$$y = mx + b$$

A diagram illustrating the components of the slope-intercept form of a line's equation, $y = mx + b$. The equation is centered at the top. Below it, two boxes are positioned: a blue box on the left containing the word "Slope" and a red box on the right containing the text "y-intercept". Two blue arrows originate from these boxes: one points from the "Slope" box to the variable m in the equation, and the other points from the "y-intercept" box to the variable b .

DO IT NOW!

Instructions: Write the equation of the following lines:

a) Line with a slope of $\frac{3}{5}$ that passes through the point B(-5, 4).

b) Line that is parallel to the line $y = 2x - 7$ and passes through the point (1, -3).

c) Line that is perpendicular to the line $2x - 2y + 4 = 0$ and passes through the point $(-2, 5)$.

Today's Lesson: Find the equation of a line given two points on the line.

What do you need to write the equation of a line?

If you are not given the slope of a line, how can you find it?

How can you find the y -intercept?

Example 1: Determine the equation of a line that passes through the points $M(4, -3)$ and $N(2, 5)$.

Step 1: Calculate the slope

Step 2: Find the y-intercept

Note: to find the y-intercept you can use any point that is on the line for your x and y values.

Step 3: Write the equation of the line

Example 2: Determine the equation of a line that passes through the points P(0, 4) and Q(7, 0).

Step 1: Calculate the slope

Step 2: Find the y-intercept

Step 3: Write the equation of the line

Example 3: Determine the equation of a line that passes through the points A(-4, 2) and B(8, 11).

Step 1: Calculate the slope

Step 2: Find the y-intercept

Step 3: Write the equation of the line

Example 4: On your own determine the equation of the line that passes through the points A(2,-4) and B(5,5)

Example 5:

a) An appliance repair company charges \$205 for a repair that takes 3 hours. The same company charges \$505 for a repair that takes 8 hours. Determine an equation that represents the cost of a repair based on the number of hours that the repair takes.

Hint: you can write two coordinate points with the information given. (ind. variable, dep. variable)

b) What is the cost of a repair that takes 7 hours?

c) If a repair costs \$385, how many hours does it take?

Consolidate:

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

If you are not given the slope you can find it if you have _____ on the line by using the

Formula: