Notes:

The equation for a line is given by:

This is called _____ where m is the _____ and b is the _____.

Slope

The slope of a line is also known as:

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We calculate slope using the following equation:

Solving for points

When we are given an x-value and we are asked to find y, we do the following:

Example 1. Consider the equation $y = 3x - 5$. Find y when x is 4.

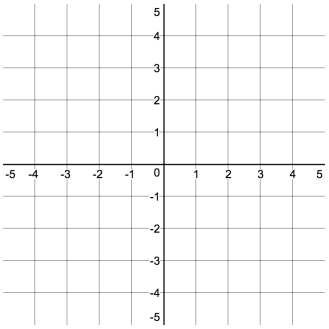
When we are given a y-value and we are asked to find x, we do the following:

Example 2. Consider the equation $y = 3x - 5$. Find x when y is 13.

Graphing

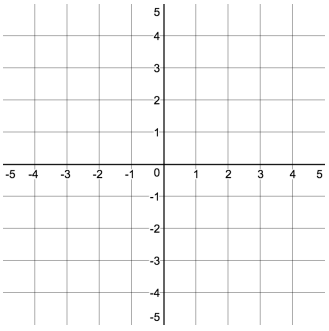
Given an equation we graph it in the following way:

Example 3. Graph the equation $y = 3x - 4$.



Given the slope and a point we graph the line in the following way:

Example 4. Graph the line that has a slope of -2 and goes through the point $(2, 3)$.



Practice Problems

Problem 5. The number of Americans without health insurance was 46.7 million in 2010, and it increased by about 1.04 million per year until 2013. Let n be the number in millions of Americans without health insurance at t years since 2010.

- Identify the slope of the model. What does it mean in this situation?
- Identify the y-intercept. What does it mean in this situation?
- Write an equation to model this situation.
- Estimate when 49 million Americans did not have health insurance.
- How many millions of people were without health insurance in 2012?

Problem 6. In 2010, the percentage of private-sector workers who were in a union was 6.95%, and it decreased by about 0.25 percentage points per year until 2014.

- Find an equation of a model to describe the situation. Explain what your variables represent.
- Estimate when the percentage of unionized workers was 6.20%.
- Estimate the percentage of private-sector workers who were <u>not</u> in a union in 2014.

Problem 7. uberXL in Tucson charges a $2.50 base fare, a $2.05 booking fee and a per mile charge of $1.65. If I paid $18.41 for an uberXL trip, how far did I go?

Problem 8. The percentages of college freshmen whose average grade in high school was an A are shown below:

Year	Percent
1970	19.6
1980	26.6
1985	28.7
1990	29.4
1995	36.1
2000	42.9
2005	46.6
2010	48.4

Let p be the percentage of college freshmen whose average grade in high school was an A at t years since 1970.

- Construct a scatterplot.
- Describe the four characteristics of the association. (make sure to include r)
- A model of the situation is $p = 0.76t_1 8.06$. Graph the model on the scatterplot (try to do this by hand!).
- Does it come close to the data points?
- Estimate when 44% of all college freshmen earned an average grade of A in high school.
- Using the linear model predict the percentage of college freshmen that earned an average grade A in high school this year.