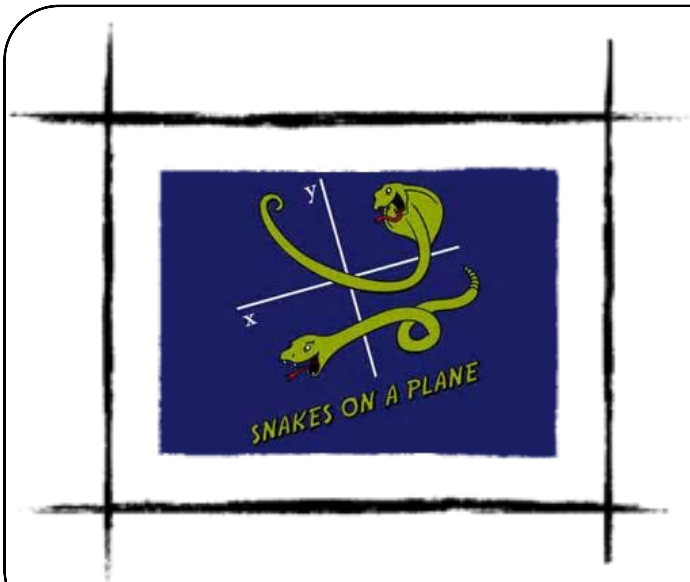


Linear Functions and Slope

By the end of this lesson, I will be able to answer the following questions…

1. How do I find the slope and equation of a linear graph based on various information?
2. How do I use a graphing calculator to graph lines and determine their properties?
3. How do I apply linear properties to applications/problem solving?

Vocabulary

Slope of a line ⟶ $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{\Delta y}{\Delta x}$

Slope Intercept Form of a Line ⟶ $y = mx + b$

General Form of a Line ⟶ $Ax + By = C$

Point Slope Form of a Line ⟶ $(y_2 - y_1) = m(x_2 - x_1)$

Prerequisite Skills with Practice

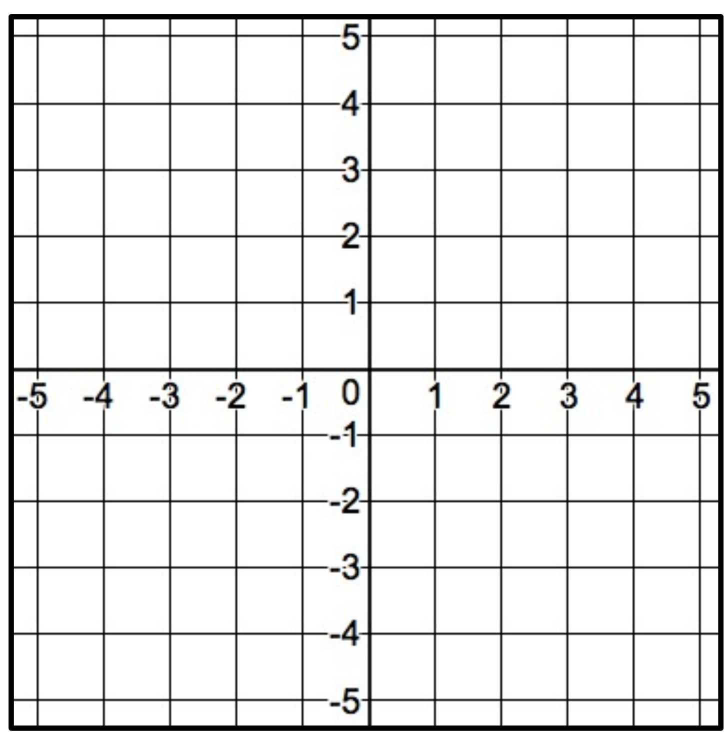
$\dfrac{3}{5} - \dfrac{3}{4} =$

$\dfrac{2/5}{3/7} =$

Finding the slope of a line given two points.

Find the slope of the line that goes through the points (-2,0) and (3,1)

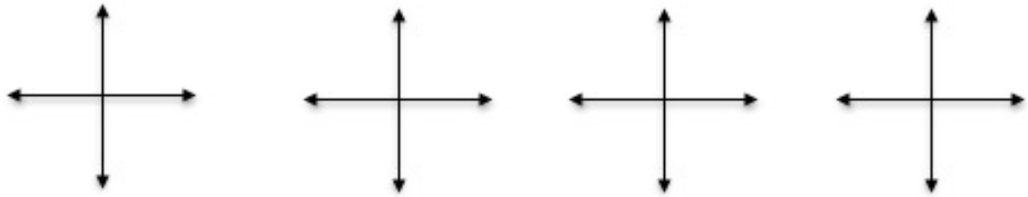
Find the slope of the line that goes through the points and (4,0) and $\left(\dfrac{2}{3}, -\dfrac{1}{2}\right)$



Generalizations about lines:

1. Positive slopes
2. Negative slopes
3. Undefined slopes
4. Zero Slopes

positive *negative* *undefined* *zero*



Why is a slope undefined?

Why is a slope zero?

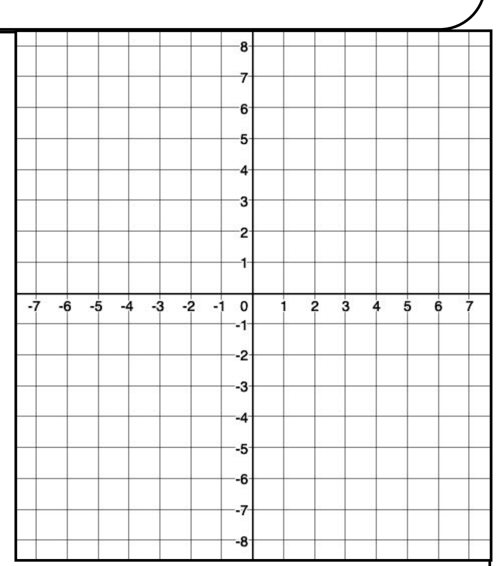
Equations of horizontal and vertical lines.

Using point-slope form of a line.

Find the equation of the line that passes through the point (1,-2) and has the slope of 3.

Using the slope-intercept form.

Find the y-intercept and slope of the line given in general form $3x-4y=10$



Properties of parallel and perpendicular lines.
**** Parallel lines have the SAME SLOPE****

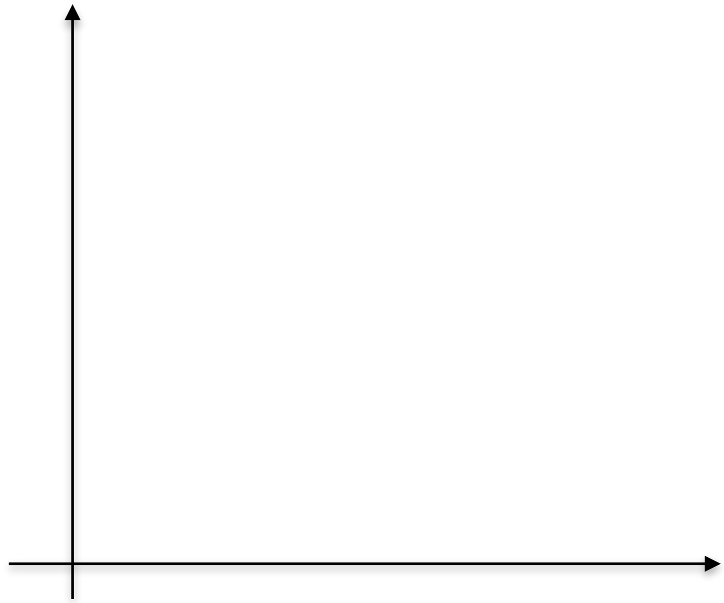
Find the slope-intercept form of the equation of the line that passes through the point (-3,3) and is parallel to the line $2x-3y=9$

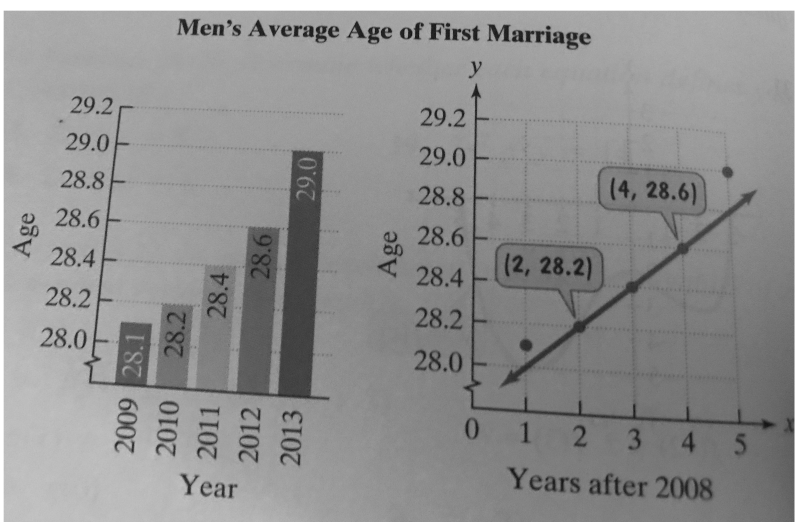
Properties of parallel and perpendicular lines.
****Perpendicular lines have slopes that are OPPOSITE RECIPROCALS****

Find the slope-intercept form of the equation of the line that passes through the point (-3,-6) and is perpendicular to the line $6x+2y=5$

Application and Modeling – using what we have learned to make predictions.

During 2009, a brand new ComicCon “HAMSTERMAN” collectible sold for $25.50. In 2014 the same collectible was sold again for $47.25. Write a linear equation to model how much the collectible is worth with respect to years. Use that equation to make a prediction about how much the collectible will be worth in 2017? What are limitations of the function you created?





Given the statistics to the left, write a linear function of men’s average age of first marriage with respect to years AFTER 2010. Use that function to predicted the men’s average age of first marriage in 2095? Is that reasonable? Why or why not?