College Algebra: Module 7 What You Need To Know

2-26-15

1 Linear Graphs and Rates of Change (Section 2.2)

Linear Equation - a *linear equation* is any equation that can be written in the form

$$ax + by = c$$

where a, b, c are real numbers

Intercepts

Y-intercept - the point where a graph passes through the y-axis. To find the y-intercept we set $x = 0$ and solve for y

X-intercept - the point where a graph passes through the x-axis. To find the x-intercept we set $y = 0$ and solve for x

Lines:

Slope of a Line: Given two different points (x_1, y_1) and (x_2, y_2) the *slope* of the line connecting these two points is given by

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Parallel Lines: two lines are parallel if they have the same slope

Perpendicular Lines: two lines are perpendicular if the slope of one line is the **negative reciprocal** of the slope of the other line

Horizontal Lines: the equation of a horizontal line is given by

$$y = k$$

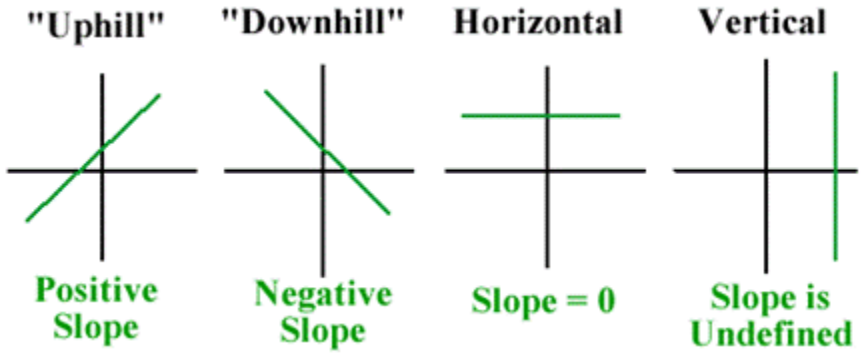
where k is some real number. The **slope of a horizontal line is always 0.**

Vertical Lines: the equation of a vertical line is given by

$$x = h$$

where h is some real number. The **slope of a vertical line is always undefined.**

Positive, Negative, Zero, or Undefined Slope:



2 Graphs and Special Forms of Linear Equations (Section 2.3)

Point-Slope Equation of a Line: The line with slope m passing through (x_1, y_1) is given by

$$y - y_1 = m(x - x_1)$$

Slope Intercept Equation of a Line: The line with slope m has a slope-intercept form of

$$y = mx + b \qquad \text{where (0,b) is the y-intercept}$$

Word Problem 1

Writing an equation and drawing its graph to model a real-world situation: Advanced

The Sugar Sweet Company is going to transport its sugar to market. It will cost $\$3125$ to rent trucks, and it will cost an additional $\$125$ for each ton of sugar transported.

Let C represent the total cost (in dollars), and let S represent the amount of sugar (in tons) transported. Write an equation relating C to S, and then graph your equation using the axes below.

Word Problem 2

Application problem with a linear function: Finding a coordinate given two points

The credit remaining on a phone card (in dollars) is a linear function of the total calling time made with the card (in minutes). The remaining credit after 27 minutes of calls is $\$15.95$, and the remaining credit after 38 minutes of calls is $\$14.30$. What is the remaining credit after 48 minutes of calls?