

**Section 1.2: Graphs and Lines**

Vertical line:

Horizontal Line:

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

Example: If the point  $(2, 5)$  on a line and the line has a slope of  $\frac{3}{4}$ , find another point on the line.

Formulas used in this course:      Point-slope formula:                      Slope intercept formula:

1. Find the equation of the line through the points  $(3, 8)$  and  $(7, 6)$ .
2. Find the equation of the line through the point  $(6, 5)$  that will be parallel to the line  $y = 3x + 8$ .
3. Find the equation of the line through the point  $(6, 5)$  that will be perpendicular to the line  $y = 3x + 8$ .
4. The percent of cell phone users with iphones was 2% at the beginning of 2008. The number of users with iphones is projected to grow linearly so at the beginning of 2012 it will be 27%. Find the equation that will model this information.
5. Bob's three year old truck has a value of \$20,000. Four years later it has a value of \$12,100. Assuming that the value of the truck depreciates in a linear manner,
  - (a) Find a formula that gives the value of the truck based on the age of the truck.
  - (b) What is the rate of depreciation?
  - (c) Find the intercepts and interpret their values.
6. Rita's Catering will provide a steak dinner for a group of  $x$  people with a cost of  $C(x) = 8.75x + 358$  given in dollars.
  - (a) If 6 additional people are added to the group, how will the cost of catering the meal change?
  - (b) If the group is decreased by 4 people, how will the cost of catering the meal change?
  - (c) Explain the meaning of  $C(60) = 883$

**Supply and Demand functions:**

The **supply function** is a formula that relates the number of items being supplied by manufacturers,  $x$ , to the price of the items,  $p$ .

The **demand function** is a formula that relates the number of items being demanded by consumers,  $x$ , to the price of the items,  $p$ .

**Note:** All points for supply and demand formulas are given as  $(x, p)$ .

**Market equilibrium** is the point where the supply and demand functions intersect.

7. When a coffee maker is priced at \$40, 200 sell. If the price increases by \$10, then 150 sell. The producer is willing to provide 240 coffee makers when the price is \$160 and are willing to provide 120 coffee makers when the price is \$88. Find the supply and demand equations and then find the equilibrium point.
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