1. Solve for $y$, when $2x - 5y = 18$

2. Solve for $y$, when $x = 15 - \frac{3}{4}y$

3. Solve for $y$ in both equations.

$$2x - 7y = -12$$
$$-5x + 4y = -3$$

4. Solve for $y$ in both equations.

$$6x = 20 - 5y$$
$$921x - 432y = 195$$

5. Solve for $y$ in both equations, graph both, and find their intersection.

$$3x + 7y = 5$$
$$-4x + 5y = 22$$

6. Solve for $y$ in both equations, graph both, and find their intersection.

$$5y - 6x = -35$$
$$-2y + 8x = 42$$

7. Solve for $y$ in both equations, graph both, and find their intersection.

$$5y - 3x = 25$$
$$x = 8y - 21$$

8. Solve for $y$ in both equations, graph both, and find their intersection.

$$8x + 4y = 13176$$
$$-5x + 8y = -5631$$

1. (a) Take west to be the positive direction. The height of a sloped roof above the place where you stand is 12 feet. If you move 3 feet west, the height is 10 feet. What is the slope?

   (b) If you move 5 additional feet west, what is the height of the roof above the place where you stand?

2. If a building twis 100 ft tall and is viewed from a spot on the ground 70 ft away from the base of the building, what is the slope of a line from the spot on the ground to the top of the building?

3. An ice cream cone is 4 inches deep and 2 inches across the top. If we wanted to make a king-sized cone that has the same shape but is 2.5 inches across the top, how deep would the cone be?

4. A tree service is to fell a tree. A rope is attached to the top of the tree to determine the direction in which the tree will fall. The rope meets the top of a 6-foot tall light pole that is 20 feet away from the tree. The rope hits the ground 10 ft on the other side of the light pole (away from the tree). There is concern the when the tree falls it will damage the light pole.

   (a) How tall is the tree?

   (b) Will the tree hit the light pole when it falls?

1. When I push the gas pedal to the floor, my speed, in miles per hour, is given by $S = 12t$, where $t$ is the time, in seconds, since I pushed the pedal to the floor. Explain in practical terms the meaning of the slope of this function.

2. The amount of money, in dollars, in my cookie jar is given by $M = 8t + 200$, where $t$ is the time, in weeks, since my birthday. Explain in practical terms the meaning of the slope of this function. Explain in practical terms the meaning of the initial value.

3. The amount of money, in dollars, in my cookie jar is given by $M = -8t + 200$, where $t$ is the time, in weeks, since my birthday. Explain in practical terms the meaning of the slope of this function. Explain in practical terms the meaning of the initial value.

4. Suppose that $f$ is a linear function such that $f(2) = 7$ and $f(5) = 19$. What is the slope of $f$?

5. Suppose that $f$ is a linear function with slope of $-3$ and that $f(2) = 8$. Find the equation for $f$.

6. Suppose that f is a linear function such that $f(3) = 7$. If the slope of f is 2.7, then what is $f(5)$?

7. An elementary school is taking a busload of children to a science fair. It costs \$130 to drive the bus to the fair and back and the school pays each student's \$2.00 admission fee.

   (a) Use a formula to express the total cost $C$ in dollars, of the science fair trip as a linear function of the number n of children who make the trip.

   (b) Identify the slope and the initial value of $C$ and explain in practical terms what they mean.

   (c) Explain in practical terms what $C(5)$ means and then calculate that value.

   (d) Solve the equation $C(n) = 146$ for $n$. Explain what the answer you get represents.

1. An ice machine is making ice in preparation for the game that starts at 7pm. The machine is monitored, and the amount of ice is recorded at the end of each hour. The results are in the following table.

| Time | 12:00pm | 1:00pm | 2:00pm | 3:00pm |
|---|---|---|---|---|
| Pounds of ice | 200 | 273 | 346 | 419 |

   (a) Determine if the data is linear.

   (b) Let $t$ denote the time in hours since noon, and let $I$ denote the pounds of ice made. Find a linear model for $I$ as a function of $t$.

   If 675 pounds of ice will be needed for the game tonight, will the ice machine produce enough ice by game time?

2. The following table shows the price of Amazon's Kindle 2 e-book reader (adapted from data on the web). Here time is measured in months since February 2009, when the Kindle was launched.

| Time | 0 | 5 | 10 | 15 |
|---|---|---|---|---|
| Price | \$349 | \$299 | \$249 | \$199 |

(a) By calculating differences, show that these data can be modeled by a linear function.

(b) Find a linear function that models these data.

(c) What price does your formula from part (b) project for January 2012?

1. For each of the following data sets: plot the data, determine the linear regression equation, and add the graph of the regression to the graph.

(a)

| $x$ | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| $y$ | 2.3 | 2 | 1.8 | 1.4 | 1.3 |

Plot: Regression Equation:

(b)

| $x$ | 1.3 | 2.5 | 3.3 | 4.2 | 5.1 |
|---|---|---|---|---|---|
| $y$ | 2.6 | 2.6 | 2 | 1.8 | 1.5 |

Plot: Regression Equation:

(c)

| $x$ | 5.2 | 8.9 | 12.6 | 16.3 | 20 |
|---|---|---|---|---|---|
| $y$ | -3.1 | -4.8 | -5.3 | -7.1 | -7.9 |

Plot: Regression Equation:

2. The table below shows the number $C$ of Crayloa colors available $t$ years after 1900.

| $t$, yr since 1900 | 3 | 49 | 58 | 72 | 90 | 98 | 103 |
|---|---|---|---|---|---|---|---|
| $C$, number of colors | 8 | 48 | 64 | 72 | 80 | 120 | 120 |

(a) Find the equation of the regression line for $C$ as a function of $t$.

(b) How many Crayola colors does the regression line indicate for 1993? Round to the nearest whole number.

3. The following table shows the average annual income in the United States, adjusted for inflation, for the given year.

| $t$, yrs since 1980 | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
|---|---|---|---|---|---|---|---|
| $I$, annual income | \$23,109 | \$23,116 | \$25,284 | \$26,594 | \$30,719 | \$30,350 | \$28,838 |

(a) Find the equation of the regression line.

(b) Plot the data along with the regression line.

(c) Explain in practical terms the meaning of the slope of the regression equation.

(d) During which year since 1990 was income much lower than would be expected from the regression model.

1. Solve algebraically:

$$3x + 2y = 6$$
$$4x - 3y = 8$$

2. Solve by graphing:

$$.7x + 5.3y = 6.6$$
$$5.2x + 2.2y = 1.7$$

3. The cost $C$ and the revenue $R$ for a brokerage firm depend on the number $T$ of transactions executed. Both $C$ and $R$ are measured in dollars. It costs \$750 per day to keep the office open. Brokers are paid an average of \$25 per transaction. \$35 in fees are collected for each transaction.

   (a) Find a formula that gives C as a function of T.

   (b) Find a formula that gives R as a function of T.

   (c) Find the number of daily transactions that are needed to make the revenue \$1500 more than the cost.

4. You are mixing blue paint with yellow paint to get a total of 10 gallons of the mixture. You want to use 3 times as much yellow paint as blue paint. How many gallons of each should you use?