1. Find the equations for the lines through the given points.
   (a) \((-4, 2)\) and \((-2, 5)\)

(b) \((1, 5)\) and \((3, -1)\)

(c) \((0, 3)\) and \((5, 3)\)
2. (a) On the following coordinate plane, draw the line with slope $m = -2$ through the point $(2, -1)$.

(b) Find the equation for the line.

(c) What is the $y$-intercept of the line?

(d) What is the $x$-intercept of the line?
3. At age 7, Megan has 18 friends. Starting at age 7, she gains 10 friends a year (and never loses any friends). How many friends does she have at age $x$?

4. Bob bought a car for $18,500 in 2004. The car is worth $9,500 in 2009. Assume that the value of the car decreases linearly. What will the car be worth in 2012?

5. A train is traveling to Boston at a constant speed. At 2:00 pm the train is 200 miles from Boston. At 3:30 pm the train is 120 miles from Boston. At what time does the train reach Boston?
6. At age 3, little Jimmy was 3 feet tall. By age 5, he had grown to 3 feet, 5 inches.

(a) Assuming linear growth, how tall do you expect Jimmy to be at age 9?

(b) Write an equation for Jimmy’s expected height (measured in inches) at age $x$.

(c) Use the Internet to find a pediatric growth chart for boys in the United States. Print out the chart and graph the line you found in part (b) on top of it. Attach the result to your homework.

(d) Using the graph from part (c), comment on the extent to which the equation from part (b) is a reasonable model. For what ages is the linear model useful?
7. If a certain textbook costs $70, consumers demand 4500 copies of the book. If the price is raised to $130, then consumers demand 3250 copies of the book.

(a) Assuming that the cost of the book and the demand for the book are linearly related, find an equation relating the cost of the book and the demand for the book. This is called the *demand curve*.

(b) The textbook company is willing to sell 2200 copies of the book at a price of $70. For each $10 increase in the price above $70, the textbook company will supply an additional 400 books. Find a linear equation relating the cost of the book and the number of books supplied by the textbook company. This is called the *supply curve*.

(c) The *equilibrium price* is the price at the intersection of the demand curve and the supply curve. In a competitive market, the price will tend to move towards the equilibrium price. Find the equilibrium price.