14. A ladder 10 feet long rests against a vertical wall. If the bottom of the ladder slides away from the wall at a rate of 1 foot/sec, how fast is the top of the ladder sliding down the wall when the bottom of the ladder is 6 feet from the wall?

15. A cylindrical water tank with its circular base parallel to the ground is being filled at the rate of 4 cubic feet per minute. The radius of the tank is 2 feet. How fast is the level of the water in the tank rising when the tank is half full?

16. A conical salt spreader is spreading salt at a rate of 3 cubic feet per minute. The diameter of the base of the cone is 4 feet and the height of the cone is 5 feet. How fast is the height of the salt in the spreader decreasing when the height of the salt in the spreader (measured from the vertex of the cone upward) is 3 feet?

17. It is estimated that the annual advertising revenue received by a certain newspaper will be $R(x) = .5x^2 + 3x + 160$ thousand dollars when its circulation is x thousand. The circulation of the paper is currently 10,000 and is increasing at a rate of 2,000 papers per year. At what rate will the annual advertising revenue be increasing with respect to time 2 years from now?

18. A stock is increasing in value at a rate of 10 dollars per share per year. An investor is buying shares of the stock at a rate of 26 shares per year. How fast is the value of the investor's stock growing when the stock price is 50 dollars per share and the investor owns 100 shares?

19. Suppose that the demand function q for a certain product is given by $q = 4000e^{-.01p}$ where p denotes the price of the product. If the item is currently selling for \$100 per unit, and the quantity supplied is decreasing at a rate of 80 units per week, find the rate at which the price of the product is changing.

The steps:

A. Draw a diagram when appropriate, and label everything.
B. Decide exactly which rates are given and exactly what rate you are asked to find. Each rate is a derivative, dx/dt. You will need a corresponding variable x for each of them.
C. Write down an equation that is true, using the variables you chose above. Don't plug in any numbers you aren't supposed to.
D. Differentiate your equation with respect to time, and circle the term you will solve for.
E. Substitute the appropriate numbers into your new equation, and solve for the appropriate term.
F. The units for dx/dt are the units of x over the units for t.