

**Related Rates Worksheet**

*Calculus*

1. As a cylindrical water tank of diameter 30 ft is draining, the level of the water decreases at a constant rate of  $\frac{5}{2}$  ft/min. How fast is the volume of the water changing?

2. A 20 ft ladder is leaning on the wall of a house. The top of the ladder is sliding down the wall at a constant rate of 4 ft/min. At what rate is the bottom of the ladder sliding away from the wall when the bottom of the ladder is 12 feet from the wall?

3. The length of a rectangle is increasing at 5 in/sec and the width is increasing at 4 in/sec.

a) How fast is the area increasing when the length is 12 in and the width is 5 in ?

b) How fast is the diagonal of the rectangle changing?

4. Sand is poured on a conical pile at a rate of  $20 \text{ m}^3/\text{min}$ . The height of the pile is always equal to twice the radius of the pile. When the pile is 3 meters high, how fast is the height of the pile increasing?