

Worksheet # 15: Related Rates

1. A ladder of length 3 meters long is leaning against a wall. The base of the ladder is sliding away from the wall at a rate of .5 meters/second. Find the speed that the ladder is moving along the wall when the top of the ladder is 2 meters above the floor.
2. A person 5 ft tall walks along a straight path at a rate of 3.5 ft/sec away from a streetlight that is 12 ft above the ground. Find the rate at which the person's shadow is changing for any time value.
3. A boat is being pulled towards a dock by a rope attached to the bow of the boat. The boat is approaching the dock at a rate of 3 meters/second. At the edge of the dock, the rope is one meter higher than it is at the bow of the boat. How fast is the rope being pulled in when the boat is 10 meters from the dock?
4. A water tank has the shape of an inverted circular cone with base radius 2 m and height 4 m. If water is pumped into the tank at a rate of $2 \text{ m}^3/\text{min}$, find the rate at which the water level is rising when the water is 3 m deep.
5. A baseball diamond is a square with side 90 ft. A player hits the ball and runs toward first base at a speed of 30 ft/s. How fast is his distance from second base decreasing when he is $\frac{2}{3}$ of the way to first base?