

Related Rates Problems Set

1. The radius of a circular puddle is 3 *meters* and it is increasing at the rate of 1 *cm/min*. How fast is the puddle's area increasing?

2. A bag is tied to the top of a 5 *meter* long ladder which is resting against a vertical wall. Suppose the ladder begins sliding down the wall in such a way that the foot of the ladder is moving away from the wall. How fast is the bag descending at the instant the foot of the ladder is 4 *meters* from the wall and the foot of the ladder is moving away from the wall at the rate of 2 *meters/sec*?

3. A 6 *ft* tall person is walking away from a streetlight that is 20 *ft* high, at the rate of 7 *ft/sec*. At what rate is the person's shadow increasing?

4. At noon, ship A is 150 *km* west of ship B. Ship A is sailing east at 35 *km/hr* and ship B is sailing north at 25 *km/hr*. How fast is the distance between the ships changing at 4pm.

5. A tank filled with water is in the shape of an inverted cone 20 *ft* high with a circular base, on top, whose radius is 5 *ft*. Water is running out of the bottom of the tank at a constant rate of 2 *ft³/min*. How fast is the water level falling when the water is 8 *ft* deep?

6. A person is standing on the ground watching a jet through a telescope as it approaches at a speed of 10 *miles/minute* at an altitude of 7 *miles*. At what rate (in *radians/minute*) is the angle of the telescope changing when the horizontal distance of the jet from the woman is 24 *miles*? When the jet is directly above the person?