

# Related Rates Practice Sheet

1. The top of a ladder slides down a vertical wall, while the bottom of the ladder is sliding on the horizontal floor, away from the wall. When the base of the ladder is 8 ft from the wall, its horizontal speed is 3 ft/s and its vertical speed is 4 ft/s. How long is the ladder?
2. A toy rocket rises vertically at a rate of 60 ft/s. A person standing on the ground 100 ft from the launch site observes the rocket's ascent. At what rate is the distance between the observer and the rocket changing when the rocket is 300 ft above the ground?
3. The radius of a cylinder increases at a constant rate. Its height is a linear function of its radius and increases three times as fast. When the radius is 1 ft the height is 6 ft. When the radius is 6 ft the volume is increasing at a rate of  $1 \text{ ft}^3/\text{s}$ . Find the rate at which the volume is increasing when the radius is 36 ft.