

## 1 Additional Exercise

**Example 1.1.** A rocket is launched so that it rises vertically. A camera is positioned 5000 ft from the launch pad. When the rocket is 1000 ft above the launch pad, its velocity is 600 ft/sec. Find the necessary rate of change of the cameras angle as a function of time so that it stays focused on the rocket.

**Example 1.2.** A cone-shaped (conical) tank is leaking water at a constant rate of  $2 \text{ ft}^3/\text{hour}$ . The base radius of the tank is 5 ft and the height of the tank is 14 ft.

- (a) At what rate is the depth of the water in the tank changing when the depth of the water is 6 ft?
- (b) At what rate is the radius of the top of the water in the tank changing when the depth of the water is 6 ft

**Example 1.3.** A 15 foot ladder is resting against the wall. The bottom is initially 10 feet away from the wall and is being pushed towards the wall at a rate of  $1/4$  ft/sec. How fast is the top of the ladder moving up the wall 12 seconds after we start pushing?