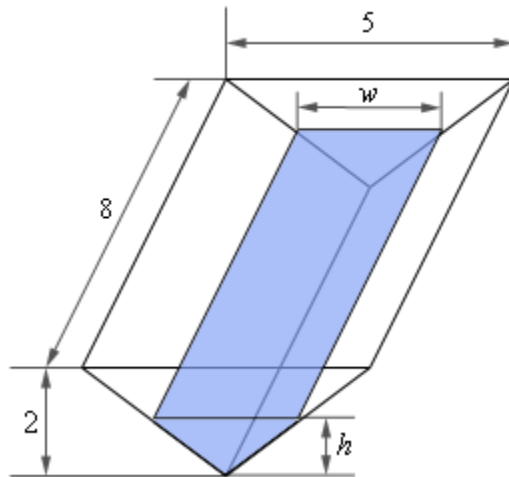


Example Air is being pumped into a spherical balloon at a rate of $5 \text{ cm}^3/\text{min}$. Determine the rate at which the radius of the balloon is increasing when the diameter of the balloon is 20 cm.

Example 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 $\frac{1}{4} \text{ ft/sec}$. How fast is the top of the ladder moving up the wall 12 seconds after we start pushing?

Example A trough of water is 8 meters long and its ends are in the shape of isosceles triangles whose width is 5 meters and height is 2 meters. If water is being pumped in at a constant rate of $6 \text{ m}^3/\text{sec}$. At what rate is the height of the water changing when the water has a height of 120 cm? At what rate is the width of the water changing when the water has a height of 120 cm?



Example A light is on the top of a 12 ft tall pole and a 5ft 6in tall person is walking away from the pole at a rate of 2 ft/sec.

- At what rate is the tip of the shadow moving away from the pole when the person is 25 ft from the pole?
- At what rate is the tip of the shadow moving away from the person when the person is 25 ft from the pole?

