## WORKSHEET 2: Related Rates

MATH 110, Jan 15, 2018

- $\star$  Include the units in your answer.
- 1. A ladder 10 feet long leans against a building. If the base of the ladder slides away from the building horizontally at a rate of 4 ft/sec, At what rate is the angle between the ladder and the ground is changing when the base is 8 feet from the building?

2. A ladder 10 feet long leans against a wall. If the base of the ladder is being pushed toward the wall horizontally at a rate of 4 ft/sec, how fast is the top of the ladder moving up the wall when the top of the ladder is 8 feet from the ground.

3. A cylindrical tank with radius 2 meters is being filled up with water at a rate of 3 m<sup>3</sup>/min. How fast is the height of the water increasing when the depth of the water in the tank is 4 meters.

4. A funnel in the shape of an inverted cone is 30 cm deep and has a diameter across the top of 16 cm. Liquid is flowing out of the funnel at the rate of  $12 \text{ cm}^3/\text{sec.}$  At what rate is the height of the liquid decreasing at the instant when the liquid in the funnel is 20 cm deep?