

This Worksheet will be collected at the end of your recitation section on **Thursday, October 6th**.

4.1. Related Rates

1. The volume of a cube is increasing at a rate of $10 \text{ cm}^3/\text{min}$. How fast is the surface area increasing when the length of an edge is 30cm ?

2. From Eugene Oregon, a car drives due west at 55 mph toward Florence, while another car drives 65 mph north toward Portland. How quickly is the distance between the two drivers changing after 45 minutes?

3. A 10-foot ladder is set against a vertical wall and the bottom of the ladder is sliding away from the wall at a rate of 1 ft/s. How fast is the angle between the ladder and the ground changing when the bottom of the ladder is 8 feet from the wall?

4. A conical water tank with vertex down has a radius of 10 feet at the top and is 25 feet tall. If water flows into the tank at a rate of $30 \text{ ft}^3/\text{min}$, how fast is the depth of the water increasing when the water is 12 feet deep?

4.2. Linear Approximations

5. Use linear approximation to give an estimate for the following values.

a) $\sqrt{9.04}$

b) $\sqrt{\sin(0.1) + 1}$

c) $(26.89)^{2/3}$

Questionnaire:

Below are a few questions which are completely optional, and are meant to benefit you. Please only fill out what you feel comfortable with.

1. Is there anyone in class that you'd like to be grouped with next week?

2. Did you feel you worked well with your group this week?

3. Any other comments?

Grading Rubric:

Attendance: /20

Participation: /20

Completeness: /60