MATH 104 Week 8 Workshop
Related Rates. Optimization November 4 to November 10, 2020

Work Product for the Week 8 Workshop: The work product for this workshop will be Quiz 5, which will be based on the material in this workshop. Quiz 5 will be available via MATH 104 ALL starting at 9 p.m. on Tuesday, November 10th, and will be open until 9 a.m. on Friday, November 13th.

1. The volume of a right circular cylinder is 60 cm^3 and is increasing at $2 \text{ cm}^3 \text{ min}^{-1}$ at a time when the radius is 5 cm and is increasing at a rate of 1 cm min^{-1}. How fast it the height of the cylinder changing at that time?

2. A water tank in the shape of an inverted right circular cone with the top radius 10 m and depth 8 m. Water is flowing in at a rate of $0.1 \text{ m}^3 \text{ min}^{-1}$.

   (a) How fast is the depth of the of the water in the tank increasing when the water is 4 m deep?

   (b) If there is a leak in this tank and water leaks out at a rate of $\dfrac{h^3}{1000} \text{ m}^3 \text{ min}^{-1}$ when the depth of the water in the tank is h m. How full can the tank get in this case.

3. State the Mean Value Theorem and Rolle's Theorem. Identify Rolle's Theorem as a special case of Mean Value Theorem.

4.