21-120: Differential and Integral Calculus
Recitation #12 Outline: 09/03/24

1. A conical tank is being filled from its vertex at a rate of 9 liters per second. Knowing that the height of the tank is 10 meters and the radius of the top is 5 meters, how fast is the water level rising when it has reached a depth of 6 meters?

2. A point P moves along the portion of the parabola $x = y^2$ located in the first quadrant, such that its x-coordinate is increasing at a rate of 5 cm/s. Calculate the rate at which the point P is moving away from the origin when $x = 9$.

3. The volume of a cube is increasing at a rate of $70\,\text{cm}^3$ per minute. How fast is the surface area increasing when the length of a side is 12 cm?

4. A spherical ice ball is melting uniformly over its surface at a rate of $50\,\text{cm}^3$ per minute. How fast is the radius of the ball decreasing when it measures 15 cm?