

Quiz 7 Outline

Format. This quiz has **2 free-response** questions.

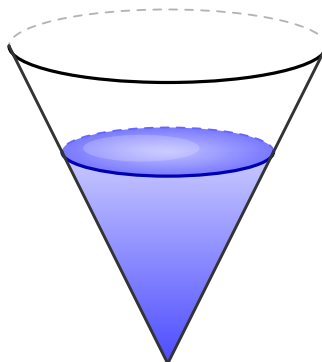
1. (5 points) Find the equation of the tangent line to $y^2 + x^3 = xe^{3y}$ at $(1, 0)$.

Show complete work—your grade will be based on the clarity and correctness of your implicit differentiation and evaluation leading to

$$y = \frac{2}{3}(x - 1)$$

2. (5 points) A right circular conical tank has height 6 m and top radius 3 m. Water is being pumped in so that the water depth h is rising at a constant rate of 0.25 m/min. How fast is the volume of water in the tank increasing at the instant when the water depth is $h = 4$ m?

Volume formula for a cone: $V_{\text{cone}} = \frac{1}{3}\pi r^2 h$.



Show complete work—your grade will be based on the clarity and correctness of your setup, differentiation, and evaluation leading to

$$\pi \text{ m}^3/\text{min}$$

Hint: See the cone example in the notes.