

MATH 101

QUIZ 3

Name:

Serial No.

section:

1. Air is being pumped into a spherical balloon so that its volume increases at a rate of $10 \text{ m}^3/s$. When the radius of the balloon is $0.5m$, the radius of the balloon increases at rate of? (volume of a sphere is $\frac{4}{3}\pi r^3$).

2. The equation of motion of a particle moving in a straight line is given by (t in seconds and s in meters)

$$s(t) = te^{-3t}, \quad t \geq 0.$$

Find the interval in which the particle is speeding up?

3. If $x = x \tanh^{-1} x + \ln \sqrt{1 - x^2}$. Find $\frac{dx}{dt}$.

4. Use linear approximation (or differentials) to estimate the number $(0.0024)^{1/2}$.