

QUIZ 1 (FALL 2003)

Problem 1. Find a general solution to the ordinary differential equation

$$(x^2 - y^2) \frac{dy}{dx} = -2xy.$$

Problem 2. Find a general solution to the ordinary differential equation

$$\frac{dy}{dt} = \frac{y - t}{y + t}.$$

Problem 3. In 30 days 50% of the initial amount of the radioactive material decayed. Find the moment of time when only one percent of the initial amount of radioactive material is left.

Problem 4. The tank of conic form has a plug on the bottom(at the vertex). The water level at the tank is 36ft . At 1:00 PM the plug was removed and at 2:00 PM the tank was empty. Find the time moment when the water level in the tank is 16ft . (Use Torricelli's law.)