

Math 3350

Midterm I

① Solve the following three 1st order differential equations:

(i) $\frac{dy}{dx} = -3y + 10; y(0) = \frac{20}{3}$

(ii) $\frac{dy}{dx} = -3x + 10; y(0) = \frac{20}{3}$

(iii) $\frac{dy}{dx} = (-3y + 10)(-3x + 10); y(0) = \frac{20}{3}$

② Solve the following 1st order differential equation

$$\frac{dy}{dx} = -3y + 4\sin(5x); y(0) = \frac{7}{17}$$

③ Solve

$$\frac{dy}{dx} + \frac{x + \sin y}{x \cos y + y^3} = 0, \quad y(0) = 2$$

④ Solve $\frac{dy}{dx} + \frac{y}{x-2} = 5(x-2)\sqrt{y}$, $y(0) = 9$
"Bernoulli equation"