

i) (10 Points) Solve the differential equation

$$\frac{dy}{dx} = 4\sqrt{xy}$$

ii) (5 Points) State whether the following differential equation is a linear first order differential equation, and if yes, find the integrating factor.

$$x \frac{dy}{dx} = (3 - 2x)y + 4x^4$$

iii) (10 Points) Use the substitution $v = y/x$ to solve the differential equation

$$5xy \frac{dy}{dx} = x^2 + 5y^2$$