**Problem 1.** Find $\frac{dy}{dx}$ for

i) $y^2x + xy = 1$

ii) $(x^2 + y)^3(x - y)$

iii) $x^2y^2 - y = x$

iv) $x^2y + y^2x = -4$

v) $\sqrt{xy} = x + 3y$

vi) $\sqrt[3]{x^2} + \sqrt[3]{y^2} = 1$

**Problem 2.** Find $\frac{d^2y}{dx^2}$ for

i) $xy = 1$

ii) $y^2 - xy = 8$

iii) $1 - xy = x - y$

iv) $4x^2 + 3y^2 = 4$

**Problem 3.** Determine the points at which the graph of $y^4 = y^2 - x^2$ is horizontal.