

1. Find dy/dx for each of the following.

(a) $y = x^2 + xy$

(b) $x^2y + y = 3$

(c) $x^{1/4} + y^{1/4} = 2$

(d) $\sqrt{x} + \sqrt{y} = 25$

(e) $x + \sin(y) = y + 1$

(f) $\sin(xy) = 2x + 5$

(g) $x^2 + xy - y^3 = xy^2$

(h) $e^{\cos(y)} = x^3 \sin(y)$

(i) $\sin(2x^2y^3) = 3x^3 + 1$

(j) $4y^2 + 2 = 3x^2$

2. Find d^2y/dx^2 for each of the following.

(a) $1 - xy = x - y^2$

(b) $x - y = (x + y)^2$

(c) $\sin(x) - 4\cos(y) = y$

3. For the curve $x^2 + y^2 - xy + 3x - 9 = 0$,

(a) Find dy/dx .

(b) Where do the horizontal tangent lines occur? ($dy/dx = 0$).

(c) Where do the vertical tangent lines occur? ($dy/dx = \pm\infty$).

(d) Find d^2y/dx^2 .

4. For the curve $x^2 + xy + y^2 = 5$,

(a) Find dy/dx .

(b) Where do the horizontal tangent lines occur? ($dy/dx = 0$).

(c) Where do the vertical tangent lines occur? ($dy/dx = \pm\infty$).

(d) Find d^2y/dx^2 .

5. For the curve $\cos(x)y^2 + (3\sin(x) - 1)y + 7x - 2 = 0$,

(a) Find dy/dx at the point $(0, 2)$.

(b) Where do the horizontal tangent lines occur? ($dy/dx = 0$).

(c) Where do the vertical tangent lines occur? ($dy/dx = \pm\infty$).