

Ongeagwara Elvis

Math 104

Matrix notation 124

- 1) i) The function is not defined when $x=2$
ii) The domain are real numbers except $x=2$
iii) The codomain are real number except $y=0$

2) If $k = \ln v$, differentiate k
solu

$$k = \ln v$$

$$\frac{dk}{dv} = \frac{1}{v}$$

$$\frac{dk}{dv} = \frac{1}{v} //$$

3) a) $2x - 3y - 2 = 0$

$$2x - 3y = 2$$

$$-3y = 2 - 2x$$

$$-y = \frac{2 - 2x}{3}$$

3

$$y = -\frac{(2 - 2x)}{3} = \frac{-2 + 2x}{3} //$$

b) $x^2 + y^2 = 4$

$$y^2 = 4 - x^2$$

$$y = \sqrt{4 - x^2} //$$

4) $p = \frac{t}{\sin}$

$$t = \sin p$$

$$\frac{dt}{dp} = \cos p$$

$$\frac{dt}{dp}$$

$$\frac{dp}{dt} = \frac{1}{\cos p}$$

$$\cos^2 p + \sin^2 p = 1$$

$$\cos^2 p = 1 - \sin^2 p$$

$$\cos p = \sqrt{1 - \sin^2 p}$$

Recall that $t = \sin p$

$$\cos p = \sqrt{1 - t^2}$$

$$\frac{dp}{dt} = \frac{1}{\sqrt{1 - t^2}} //$$

5) $f(x) = 2x^2 - 5$, $g(x) = 4x - 2$

$$f \circ g(x) = 2(4x - 2)^2 - 5$$

$$= 2(16x^2 - 16x + 4) - 5$$

$$= 32x^2 - 32x + 8 - 5$$

$$= 32x^2 - 32x + 3$$

$$g \circ f(x) = 4(2x^2 - 5) - 2$$

$$= 8x^2 - 20 - 2$$

$$= 8x^2 - 22$$

6) $F(x) = \frac{F(x) + F(-x)}{2}$

$$F(-x) = 3(-x)^2 - 2(-x) + 1$$

$$= 3x^2 + 2x + 1$$

$$f(x) = \frac{3x^2 - 2x + 1 + (3x^2 + 2x + 1)}{2}$$

$$= \frac{4x^2}{2} = 2x$$

$$F_e(x) + F_o(x) = 3x^2 + 1 - 2x$$

$$= 3x^2 - 2x + 1$$

10) $y = \sin(3x^2 + 5)$

$$\frac{dy}{dx} = \cos(3x^2 + 5)$$

$$\frac{dy}{dx} = \cos(3x^2 + 5)$$

$$\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx} = \cos u \times 6x$$