

18/ENG02/095 Computer Engineering TOWURU  
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MATRIC NOS: 18/ENG02/095

DEPARTMENT: COMPUTER ENGINEERING

(2) Given  $2y^2 - 5x^4 - 2 - 7y^3 = 0$   
determine  $\frac{dy}{dx}$

firstly differentiate with respect to  $x$

~~$\frac{d}{dx}(2y^2 - 5x^4 - 2 - 7y^3) = 0$~~

$$\frac{d}{dx}(2y^2) - \frac{d}{dx}(5x^4) - \frac{d}{dx}(2) - \frac{d}{dx}(7y^3) = \frac{dy}{dx} \cdot \frac{dy}{dx}$$

$$4y \frac{dy}{dx} - 20x^3 - 0 - 21y^2 \frac{dy}{dx} = 0$$
$$= (4y - 21y^2) \frac{dy}{dx} = 20x^3$$

$$= \frac{dy}{dx} = \frac{20x^3}{(4y - 21y^2)}$$

(3) differentiating: find  $\frac{dy}{dx}$  of  $4x^2 + 2xy^3 - 5y^2 = 0$   
evaluate  $\frac{dy}{dx}$  when  $x=1$  and  $y=2$ .

differentiating each term in turn with respect to  $x$  gives

$$\frac{d}{dx}(4x^2) + \frac{d}{dx}(2xy^3) - \frac{d}{dx}(5y^2) = \frac{d}{dx}0 = 0$$
$$8x + [(2x)(3y^2 \frac{dy}{dx}) + (y)^3(2)] - 10y \frac{dy}{dx} = 0$$

$$= 8x + 6xy^2 \frac{dy}{dx} + 2y^3 - 10y \frac{dy}{dx} = 0$$

$$8x^2 + 6xy^2 \frac{dy}{dx} + 2y^3 - 10y \frac{dy}{dx} = 0$$

$$8x + 2y^3 = (10y - 6xy^2) \frac{dy}{dx}$$

$$\frac{dy}{dx} = \frac{8x + 2y^3}{10y - 6xy^2} = \frac{4x + y^3}{y(5 - 3xy)}$$

(B) when  $x=1, y=2$

$$\frac{dy}{dx} = \frac{4(1) + 2(2)^3}{2(5-3)(1)(2)(-2)} = \frac{12}{-8} = -\frac{3}{2}$$