

Abubakar Ayuba Abbas  
19/MHS01/011  
MBBS MHS  
Maths 104

— Assignment

Q  $y = 2x^2$  at point  $(1, 2)$   
 $\frac{dy}{dx} = 4x$

$m = \frac{dy}{dx} \Big|_{x=1} \therefore f'(1) = 4$

Equation of tangent  
 $y - 2 = 4(x - 1)$   
 $y - 2 = 4x - 4$   
 $y = 4x - 2$

for the normal equation  
 $m = -\frac{1}{4}$

$y - 2 = -\frac{1}{4}(x - 1)$   
 $4y - 8 = -x + 1$   
 $4y + x - 9 = 0$   
 $4y = 9 - x$

Q  $y = 3x^2 - 2x$  at the point  $(2, 8)$   
 $\frac{dy}{dx} = 6x - 2$

$m = \frac{dy}{dx} \Big|_{x=2}$

$\therefore (6(2) - 2) = 10$

IV  $y = 1 + 2x^2$  at point  $(-2, 5)$

$$\frac{dy}{dx} = 1 + 2x$$

$$m = \left. \frac{dy}{dx} \right|_{x=-2}$$

$$\therefore 1 + 2(-2) = 5$$

Equation of tangent

$$y + 5 = 5(x + 2)$$

$$y + 5 = 5x + 10$$

$$y - 5x - 5 = 0$$

$$\underline{y = 5x + 5}$$

For the normal equation

$$m = -\frac{1}{5}$$

$$y + 5 = -\frac{1}{5}(x + 2)$$

$$5y + 25 = -x - 2$$

$$5y + x + 27 = 0$$

$$\underline{5y = -x - 27}$$

V  $y = \frac{1}{x}$  at point  $(3, \frac{1}{3})$

$$y = x^{-1}$$

$$\left. \frac{dy}{dx} \right|_{x=3}$$

$$m = \left. \frac{dy}{dx} \right|_{x=3}$$

$$\therefore 3^{-2} = -\frac{1}{3^2} = -\frac{1}{9}$$

Equation of tangent

$$y - \frac{1}{3} = -\frac{1}{9}(x - 3)$$

$$9y - 3 = -x + 3$$

$$9y + x - 6 = 0$$

$$\underline{9y = 6 - x}$$

for the eqn. of Normal

$$m = \frac{1}{9}$$

$$y - \frac{1}{3} = \frac{1}{9}(x - 3)$$

$$y - \frac{1}{3} = \frac{1}{9}x - \frac{1}{3}$$

$$y - \frac{1}{9}x + \frac{80}{9} = 0$$

$$\underline{y = \frac{1}{9}x - \frac{80}{9}}$$

Equation of Tangent

$$y - 8 = 10(x - 2)$$

$$y - 8 = 10x - 20$$

$$y = 10x - 12$$

For the normal equation

$$m = -1/10$$

$$y - 8 = -1/10(x - 2)$$

$$10y - 80 = -x + 2$$

$$10y + x - 82 = 0$$

$$10y = 82 - x$$

vt  $y = x^3/2$  at point  $(-1, -1/2)$

$$m = \frac{dy}{dx} = 3 \cdot \frac{x^2}{2} = \frac{3}{2} \cdot x^2$$

$$\frac{dy}{dx} \Big|_{x=-1} \therefore \frac{3}{2}(-1)^2 = \frac{3}{2}$$

Equation of Tangent

$$y + \frac{1}{2} = \frac{3}{2}(x + 1)$$

$$2y + 1 = 3x + 3$$

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

$$2y = 3x + 2$$

Equation of Normal

$$m = -1/3/2 = -2/3$$

$$y + \frac{1}{2} = -2/3(x + 1)$$

$$3y + 3/2 = -2x - 2$$

$$3y + 2x + 7/2 = 0$$

$$3y = -2x - 7/2$$