

**NAME; HARRISON DAVIDA EBERECHI**

**MATRIC NUM; 19/MHSO1/181**

**DEAPRTMENT; MEDICINE AND SUGERY**

**1.  $Y=2x^2$  at the point (1,2)**

**Solution**

$$Y = 2x^2$$

$$dy/dx = 4x$$

$$dy/dx \bigg|_{(x=1)} = 4(1) = 4$$

Equation of tangent;

$$y - y_1 = m(x - x_1)$$

$$y - 2 = 4(x - 1)$$

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

$$y - 2 - 4x + 4 = 0$$

$$y - 4x + 2 = 0$$

Equation of normal;

$$M_1 M_2 = -1$$

$$M_2 = -1/4$$

$$y - y_1 = -1/4(x - x_1)$$

$$y-2=-1/4(x-1)$$

$$4y-8=-x+1$$

$$4y+x-9=0$$

2.  $Y=3x^2-2x$ , at the point (2,8)

$$dy/dx=6x-2$$

$$dy/dx(x-2)=6(2)-2$$

$$m=10$$

Equation of a tangent

$$y-y_1=m(x-x_1)$$

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

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

$$y-10x+12=0$$

Equation of normal

$$M_1m_2=-1$$

$$10m_2=-1$$

$$M_2=-1/10$$

$$y-y_1=-1/10(x-x_1)$$

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

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

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

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

3.  $Y=x^3/2$  at the point  $(-1, -1/2)$

$$dy/dx=6x/4$$

$$dy/dx(x \rightarrow -1)=6(-1)/4$$

$$m=-3/2$$

Equation of a tangent

$$y-y_1=m(x-x_1)$$

$$y+1/2=-3/2(x+1)$$

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

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

$$2y+3x+4=0$$

Equation of the normal

$$M_1m_2=-1$$

$$-3/2m_2=-1$$

$$M_2=2/3$$

$$y-y_1=2/3(x-x_1)$$

$$y+1/2=2/3(x+1)$$

$$3(y+1/2)=2(x+1)$$

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

$$3y-2x+1/2=0$$

4.  $Y=1+x-x^2$  at the point  $(-2, -5)$

$$dy/dx=1-2x$$

$$dy/dx(x \rightarrow -2) = 1 - 2(-2)$$

$$m = 5$$

Equation of the tangent

$$y - y_1 = m(x - x_1)$$

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

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

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

Equation of a normal

$$M_1 M_2 = -1$$

$$M_2 = -1/5$$

$$Y + 5 = m(x + 2)$$

$$Y + 5 = -1/5(x + 2)$$

$$5(y + 5) = -1(x + 2)$$

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

5.  $1/x$  at the point  $(3, 1/3)$

$$dy/dx = -x^{-2}$$

$$dy/dx(x \rightarrow 3) = -(3)^{-2}$$

$$m = -1/9$$

Equation of tangent

$$y - y_1 = m(x - x_1)$$

$$y - 1/3 = -1/9(x - 3)$$

$$y - 1/3 = -1/9x + 1/3$$

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

Equation of a normal

$$y-y_1=m(x-x_1)$$

$$m_1m_2=-1$$

$$-1/9m_2=-1$$

$$M_2=9$$

$$y-1/3=9(x-3)$$

$$y-1/3=9x-27$$

$$y-9x+80/3=0$$