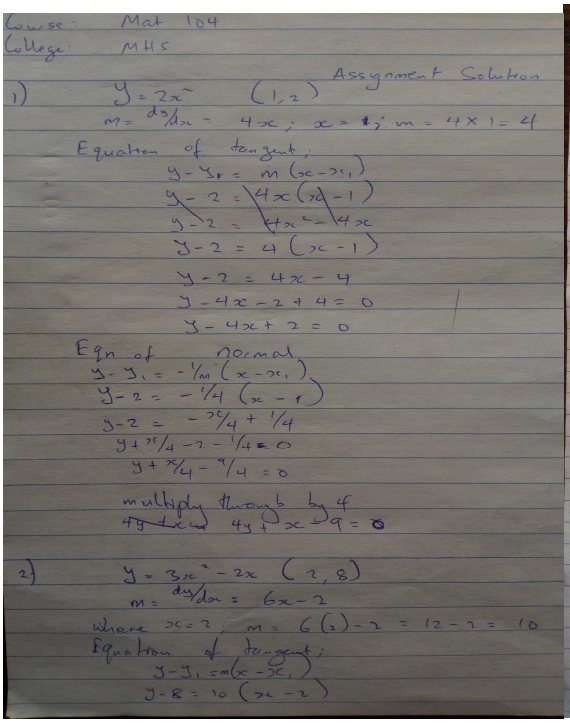
GWARAM, MUBARAK……19/MHS01/249……MBBS……MAT 104 ASSIGNMENT



Course: Mat 104
College: MHS

Assignment Solution

1) $y = 2x^2 \quad (1,2)$

$m = dy/dx = 4x; \quad x = 1; \quad m = 4 \times 1 = 4$

Equation of tangent:

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

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

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

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

$y - 2 = 4x - 4$

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

$y - 4x + 2 = 0$

Eqn of normal

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

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

$y - 2 = -x/4 + 1/4$

$y + x/4 - 2 - 1/4 = 0$

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

multiply through by 4

$4y + x - 9 = 0$

2) $y = 3x^2 - 2x \quad (2,8)$

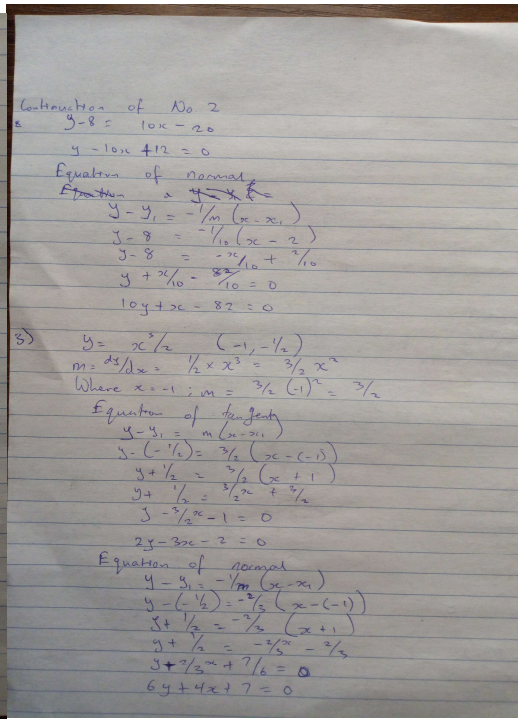
$m = dy/dx = 6x - 2$

Where $x = 2$; $m = 6(2) - 2 = 12 - 2 = 10$

Equation of tangent:

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

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



Continuation of No 2

$y - 8 = 10x - 20$

$y - 10x + 12 = 0$

Equation of normal

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

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

$y - 8 = -x/10 + 2/10$

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

$10y + x - 82 = 0$

3) $y = x^{3/2} \quad (-1, -1/2)$

$m = dy/dx = 1/2 \times x^3 = 3/2\, x^2$

Where $x = -1$; $m = 3/2\,(-1)^2 = 3/2$

Equation of tangent

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

$y - (-1/2) = 3/2\,(x - (-1))$

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

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

$y - 3/2\,x - 1 = 0$

$2y - 3x - 2 = 0$

Equation of normal

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

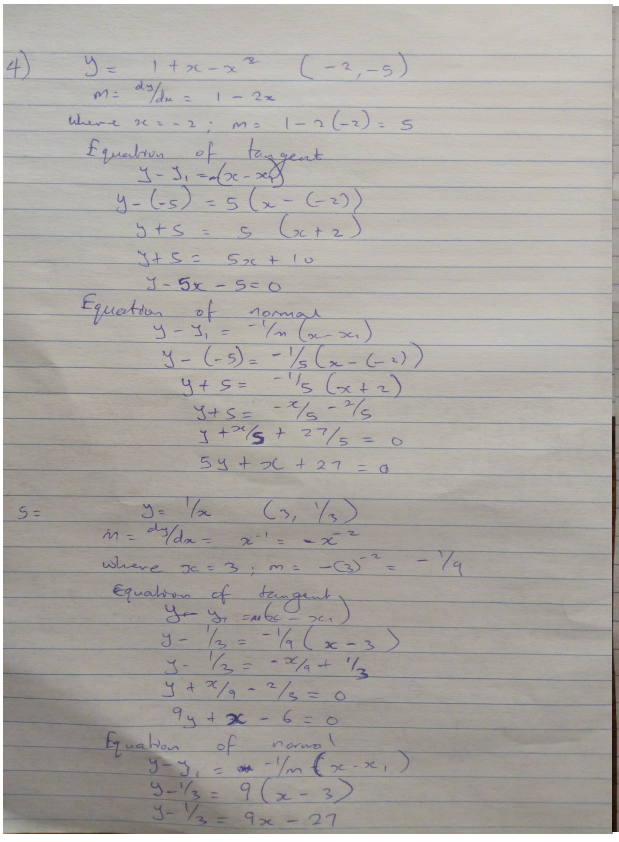
$y - (-1/2) = -2/3\,(x - (-1))$

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

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

$y + 2/3\,x + 7/6 = 0$

$6y + 4x + 7 = 0$



4) $y = 1 + x - x^2 \quad (-2, -5)$

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

Where $x = -2$; $m = 1 - 2(-2) = 5$

Equation of tangent

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

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

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

$y + 5 = 5x + 10$

$y - 5x - 5 = 0$

Equation of normal

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

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

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

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

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

$5y + x + 27 = 0$

5) $y = 1/x \quad (3, 1/3)$

$m = dy/dx = x^{-1} = -x^{-2}$

Where $x = 3$; $m = -(3)^{-2} = -1/9$

Equation of tangent

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

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

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

$y + x/9 - 2/3 = 0$

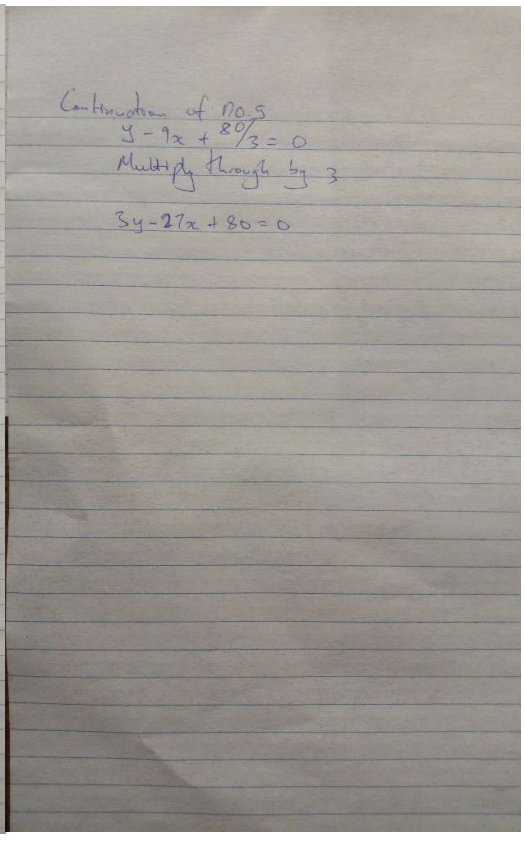
$9y + x - 6 = 0$

Equation of normal

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

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

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



Continuation of no.5

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

Multiply through by 3

$3y - 27x + 80 = 0$