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MBBS

MAT 104

① $y = 2x^2$ at the point $(1, 2)$

$dy/dx = 4x$ $m = dy/dx \mid x = x_1 = 1$

$m = 4x$, $m = 4(1)$, $m = 4$

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

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

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

For normal equation

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

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

$4y - 8 = -x + 1$

$4y + x = 9$

② $y = 3x^2 - 2x$ at points $(2, 8)$

$dy/dx = 6x - 2$

$m = dy/dx$ $m = 6x - 2$, $m = 10$

$y - y_1 = m(x - x_1)$, $y - 8 = 10(x - 2)$

$y - 8 = 10x - 20$, $y - 10x = -12$

for a normal equation

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

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

$10y - 80 = -x + 2$, $10y + x = 82$

③ $y = x^{3/2}$ at the point $(-1, -1/2)$

$dy/dx = 3/2x^2$ From $y = 1/2x^3$

$m = 3/2$

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

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

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

$y + 1/2 = 3/2 x + 3/2$, $2(2y + 1) = 6(x + 1)$

$4y + 2 = 6x + 6$, $4y - 6x = 4$

For normal equation

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

$y + 1/2 = -4/3 (x + 1)$, $3(y + 1/2) = -2(x + 1)$

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

④ $y = 1 + x - x^2$ at point $(-2, -5)$

$dy/dx = 1 - 2x$ $m = 5$

$y - y_1 = m(x - x_1)$, $y - (-5) = 5(x - (-2))$

$y + 5 = 5(x + 2)$, $y - 5x = 10 - 5$

$y - 5x = 5$

For normal equation

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

$y - (-5) = -1/5 (x - (-2))$, $5y + 25 = -1(x + 2)$

$5y + x = -2 - 25$, $5y + x = -27$

⑤ $y = 1/x$ $dy/dx = m = -1/9$

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

$9y - 3 = -x + 3$, $9y + x = 6$

For normal equation

$y - 1/3 = 9(x - 3)$, $y - 1/3 = 9x - 27$

$y - 9x - 1/3 + 27 = 0$

$y - 9x = 80/3$