Ahora Chukwuweike
NOBS
19/MHS01/1061

MAT104
(1,2)

1

1) $f(x) = y = 2x^2$

$f'(x) = 4x$

$f'(1) = 4(1)$

$f'(1) = 4$

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

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

$y - 2 = 4x - 4$

$y - 4x - 4 + 2$

$y = 4x - 2$

Using the inverse reciprocal of the slope, $m = \frac{1}{4}$

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

$y - 2 = -\frac{1}{4}(x - 1)$

$y - 2 = -\frac{1}{4}x + \frac{1}{4}$

$y = \frac{1}{4}x + \frac{1}{4} + 2$

$y = \frac{1}{4}x - \frac{9}{4}$

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

$f'(x) = 6x - 2$

$f'(2) = 6(2) - 2$

$f'(2) = 12 - 2$

$f'(2) = 10$

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

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

$y - 8 = 10x - 20$

$y = 10x - 20 + 8$

$y = 10x - 12$

using the inverse reciprocal of the slope, $m = -\frac{1}{10}$

$y - 8 = -\frac{1}{10}(x - 2)$

$y - 8 = -\frac{1}{10}x + \frac{1}{5}$

$-\frac{1}{10} \times 2 = -\frac{2}{10}$

$y = -\frac{1}{10} + \frac{1}{5} + 8$

$y = -\frac{1}{10} + \frac{41}{5}$

2

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

$f(x) = \frac{1}{2}x^3$

use differentiation rule

$f'(x) = \frac{1}{2} \times \frac{d}{dx}(x^3)$

$f'(x) = \frac{1}{2} \times 3x^2$

$f'(x) = \frac{3}{2}x^2$

$F(-1) = \frac{3}{2}(-1)^2$

$F(-1) = \frac{3}{2} \times 1$

$F(-1) = \frac{3}{2}$

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

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

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

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

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

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

using the inverse reciprocal of the slope, $m = +\frac{2}{3}$

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

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

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

$y = -\frac{2}{3}x + \frac{7}{6}$

$y = -\frac{2}{3}x + \frac{7}{6}$

3

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

$F(x) = 1 - 2x$

$F'(-2) = 1 - 2(-2)$

$F'(-2) = 1 + 4$

$F'(-2) = 5$

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

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

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

$y + 5 = 5x + 10$

$y = 5x + 10 - 5$

$y = 5x + 5$

using the inverse reciprocal of the slope $m = -\frac{1}{5}$

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

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

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

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

$y = -\frac{1}{5}x - \frac{27}{5}$

5 $y = \frac{1}{x}$ $(3, \frac{1}{3})$

4

$F(x) = \frac{d}{dx}\left(\frac{1}{x}\right)$

Using differentiation rule

$F(x) = \frac{\frac{d}{dx}(x)}{x^2}$

$F'(x) = \frac{1}{x^2}$

$F'(3) = \frac{1}{(3)^2}$

$F'(3) = -\frac{1}{9}$

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

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

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

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

$y = \frac{1}{9}x - \frac{2}{3}$ $y = \frac{1}{9}x$ $y = \frac{1}{9}x - \frac{2}{3}$

Using the inverse reciprocal of $m = \frac{9}{1}$

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

$y - \frac{1}{3} = 9x - 27$

$y = 9x - 27 + \frac{1}{3}$

$y = 9x - \frac{55}{3}$

$y = 9x - \frac{80}{3}$

5