

Calculus Worksheet #3 Unit 5 Selected Solutions

Find dy/dx for each of the following functions.

$$3. \quad y = (2x^3 - 7x + 3)^5$$
$$dy/dx = 5(2x^3 - 7x + 3)^4(6x^2 - 7)$$

$$4. \quad y = \sqrt{x^2 - 9}$$
$$y = (x^2 - 9)^{(1/2)}$$
$$dy/dx = (1/2)(x^2 - 9)^{(-1/2)}(2x)$$
$$dy/dx = x(x^2 - 9)^{(-1/2)}$$

$$8. \quad y = (7x^2 + 2x + 3)(3x + 2)^2$$
$$dy/dx = (7x^2 + 2x + 3)[2(3x + 2)^1(3)] + (3x + 2)^2[14x + 2]$$
$$dy/dx = 6(7x^2 + 2x + 3)(3x + 2) + 2(3x + 2)^2(7x + 1)$$
$$dy/dx = 2(3x + 2)[3(7x^2 + 2x + 3) + (3x + 2)(7x + 1)]$$
$$dy/dx = 2(3x + 2)[21x^2 + 6x + 9 + 21x^2 + 17x + 2]$$
$$dy/dx = 2(3x + 2)(42x^2 + 23x + 11)$$

$$11. \quad y = (3x^2 + 1)^5(2x + 1)^3$$
$$dy/dx = (3x^2 + 1)^5 [3(2x + 1)^2(2)] + (2x + 1)^3 [5(3x^2 + 1)^4(6x)]$$
$$dy/dx = 6(3x^2 + 1)^5(2x + 1)^2 + 30x(2x + 1)^3(3x^2 + 1)^4$$
$$dy/dx = 6(3x^2 + 1)^4(2x + 1)^2[3x^2 + 1 + 5x(2x + 1)]$$
$$dy/dx = 6(3x^2 + 1)^4(2x + 1)^2[3x^2 + 1 + 10x^2 + 5x]$$
$$dy/dx = 6(3x^2 + 1)^4(2x + 1)^2(13x^2 + 5x + 1)$$

$$14. \quad y = \frac{2x - 5}{3x + 4}$$
$$dy/dx = \frac{(3x + 4)(2) - (2x - 5)(3)}{(3x + 4)^2}$$

$$dy/dx = \frac{6x + 8 - 6x + 15}{(3x + 4)^2}$$

$$dy/dx = \frac{23}{(3x + 4)^2}$$

$$17. \quad y = \frac{x^2}{x - 1}$$
$$dy/dx = \frac{(x - 1)(2x) - (x^2)(1)}{(x - 1)^2}$$

$$dy/dx = \frac{2x^2 - 2x - x^2}{(x - 1)^2}$$

$$dy/dx = \frac{x^2 - 2x}{(x - 1)^2}$$