

## Calculus Worksheet #2 Unit 6 Selected Solutions

Find  $dy/dx$  for each of the following.

If  $y = \tan(u)$  where  $u = f(x)$ , then  $dy/dx = \sec^2(u) du/dx$ .

2.  $y = \tan(1 - x^2)$

$$dy/dx = [\sec^2(1 - x^2)] (-2x)$$

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

5.  $y = \tan^5(2x - 3)$

$$dy/dx = 5 \tan^4(2x - 3) [\sec^2(2x - 3)] (2)$$

$$dy/dx = 10 \tan^4(2x - 3) \sec^2(2x - 3)$$

If  $y = \cot(u)$  where  $u = f(x)$ , then  $dy/dx = -\csc^2(u) du/dx$ .

8.  $y = \cot(x^2 + 1)$

$$dy/dx = [-\csc^2(x^2 + 1)] (2x)$$

$$dy/dx = -2x \csc^2(x^2 + 1)$$

10.  $y = \cot^3(4x + 3)$

$$dy/dx = 3 \cot^2(4x + 3) [-\csc^2(4x + 3)] (4)$$

$$dy/dx = -12 \cot^2(4x + 3) \csc^2(4x + 3)$$

If  $y = \sec(u)$  where  $u = f(x)$ , then  $dy/dx = \sec(u) \tan(u) du/dx$ .

11.  $y = \sec(2x)$

$$dy/dx = [\sec(2x) \tan(2x)] (2)$$

$$dy/dx = 2 \sec(2x) \tan(2x)$$

15.  $y = \sec^7(x^2 + 9)$

$$dy/dx = 7 \sec^6(x^2 + 9) [\sec(x^2 + 9) \tan(x^2 + 9)] (2x)$$

$$dy/dx = 14x \sec^7(x^2 + 9) \tan(x^2 + 9)$$

If  $y = \csc(u)$  where  $u = f(x)$ , then  $dy/dx = -\csc(u) \cot(u) du/dx$ .

18.  $y = \csc(x^5)$

$$dy/dx = [-\csc(x^5) \cot(x^5)] (5x^4)$$

$$dy/dx = -5x^4 \csc(x^5) \cot(x^5)$$

19.  $y = \csc^5(2x - 3)$

$$dy/dx = 5 \csc^4(2x - 3) [-\csc(2x - 3) \cot(2x - 3)] (2)$$

$$dy/dx = -10 \csc^5(2x - 3) \cot(2x - 3)$$