

## Differentiation Quiz

Use the rules for differentiation to find  $\frac{dy}{dx}$  (no t's in your answers.)

1.  $y = 4x^3 + 3x + 2$

1. \_\_\_\_\_

2.  $y = \sqrt{u}$ ,  $u = \sin v$ ,  $v = x^3 - 1$

2. \_\_\_\_\_

3.  $y = \log 3x - 10^x - \cos x + (3x + 5)^4$

3. \_\_\_\_\_

4.  $y = \sin t$ ,  $x = \cos t$

4. \_\_\_\_\_

5.  $y = \tan^3(2x - 4)$

5. \_\_\_\_\_

6.  $x^4 - 5xy + 6y^4 = 212$

7.  $y = \frac{5}{(x^2 - 4)^3}$

6. \_\_\_\_\_

7. \_\_\_\_\_

8.  $y = (x + 4)^{10}(3x - 1)$

8. \_\_\_\_\_

9.  $y = \frac{(2x + 1)^3(3x - 4)^8}{3x - 4}$

9. \_\_\_\_\_

10.  $e^{3x}y = (\sec x)^2$

10. \_\_\_\_\_

$$1. \quad y = 4x^3 + 3x + 2$$

$$2. \quad y = \sqrt{u}, \quad u = \sin v, \quad v = x^3 - 1$$

$$3. \quad y = \log 3x - 10^x - \cos x + (3x + 5)^4$$

$$4. \quad y = \sin t, \quad x = \cos t$$

$$5. \quad y = \tan^3(2x - 4)$$

$$6. \quad x^4 - 5xy + 6y^4 = 212$$

$$7. \quad y = \frac{5}{(x^2 - 4)^3}$$

$$8. \quad y = (x + 4)^{10}(3x - 1)$$

$$9. \quad y = \frac{(2x + 1)^3(3x - 4)^8}{3x - 4}$$

$$10. \quad e^{3x}y = (\sec x)^2$$

$$1. \quad \underline{12x^2 + 3}$$

$$2. \quad \frac{3x^2 \cos(x^3 - 1)}{2\sqrt{\sin(x^3 - 1)}}$$

$$3. \quad \frac{1}{x \ln 10} - 10^x \ln 10 + \sin x + 12(3x + 5)^3$$

$$4. \quad \frac{-x}{\sqrt{1 - x^2}}$$

$$5. \quad 6 \tan^2(2x - 4) \sec^2(2x - 4)$$

$$6. \quad \frac{5y - 4x^3}{24y^3 - 5x}$$

$$7. \quad -30x(x^2 - 4)^{-4} \text{ or } \frac{-30x}{(x^2 - 4)^4}$$

$$8. \quad \begin{aligned} &(x + 4)^9(10(3x - 1) + 3(x + 4)) \\ &(x + 4)^9(33x + 2) \end{aligned}$$

$$9. \quad \begin{aligned} &\text{simplify first} \\ &(2x + 1)^2(3x - 4)^6(60x - 3) \end{aligned}$$

$$10. \quad \frac{2 \sec^2 x \tan x - 3ye^{3x}}{e^{3x}}$$