

Differentiation Quiz  
Form A

Use the rules for differentiation to find  $\frac{dy}{dx}$

1.  $y = 3x^5 - 4x^2 - 15$

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

2.  $y = u^3, u = \sin z, z = e^x$

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

3.  $y = \ln 5x - 3^x - (4x - 1)^5$

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

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

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

5.  $y = \tan^3(2x + 1)$

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

6.  $2x^2 - 7xy^3 + 4y^5 = 128$

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

7.  $y = \frac{15x^3 - 5x^2}{5x}$

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

8.  $y = (3x - 1)^3(1 + 2x)$

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

9.  $y = \frac{(x - 1)(x + 8)}{5x + 1}$

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

10.  $3y \sin x = e^{2x}$

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

## Answers

1.  $15x^4 - 8x$

2.  $3e^x (\sin e^x)^2 \cos e^x$

3.  $\frac{1}{x} - 3^x \ln 3 - 20(4x-1)^4$

4.  $\frac{dy}{dx} = \frac{dy/dt}{dx/dt} = \frac{-\sin t}{-\cos t} = \tan t$ , but since  $x = -\sin t$ , set up a right triangle and find that  $\tan t = \frac{-x}{\sqrt{1-x^2}}$

5.  $6 \tan^2(2x+1) \sec^2(2x+1)$

6.  $\frac{7y^3 - 4x}{20y^4 - 21xy^2}$

7.  $6x - 1$

8.  $(3x-1)^2 [24x+7]$

9.  $\frac{5x^2 + 2x + 47}{(5x+1)^2}$

10.  $\frac{-3y \cos x + 2e^{2x}}{3 \sin x}$