

Pre-Calculus

Unit 3 Quiz (practice test)

1. Rewrite the following expression with positive exponents.

$$\left(\frac{3^x}{5^y}\right)^{-2}$$

- a)  $\frac{3^{-2x}}{5^{-2y}}$     b)  $\frac{5^y}{3^x}$     c)  $\frac{3^{-x}}{5^{-y}}$     d)  $\frac{5^{2y}}{3^{2x}}$

3. Rewrite the following exponential expression in logarithmic form.

$$3^{x+4} = 217$$

- a)  $\log_3 217 = x + 4$     b)  $\log_3(x + 4) = 217$   
 c)  $\log_{217} 3 = x + 4$     d)  $\log_{217}(x + 4) = 3$

5. Evaluate the following expression.

$$\log_2 64$$

- a) 8    b) 6    c) -6    d) -8

7. Write the following expression into expanded form.

$$\ln\left(\frac{y^2 z^3}{x^4}\right)$$

- a)  $4 \ln x + 2 \ln y + 3 \ln z$   
 b)  $-4 \ln x + 2 \ln y + 3 \ln z$   
 c)  $-4 \ln x - 2 \ln y + 3 \ln z$   
 d)  $4 \ln x - 2 \ln y - 3 \ln z$

9. Solve the following exponential equation.

$$2e^{x+5} = 100$$

- a)  $x = \ln 100 - 5$     b)  $x = \ln 95$   
 c)  $x = \ln 50 - 5$     d)  $x = \ln 45$

2. Which transformation is NOT present in the following function?

$$y = -6(3^{2x}) - 7$$

- a) vertical stretch    b) horizontal stretch  
 c) vertical shift    d) horizontal shift

4. Rewrite the following logarithmic expression into exponential form.

$$\ln(x + 2) = 6$$

- a)  $6^e = x + 2$     b)  $6^{x+2} = e$   
 c)  $e^6 = x + 2$     d)  $e^{x+2} = 6$

6. What graphical transformation does the negative sign represent in the following function?

$$y = -3 \ln(x + 4)$$

- a) vertical reflection    b) vertical shift  
 c) horizontal shift    d) horizontal reflection

8. Write the following expression into condensed form.

$$\ln a - \ln b + 3 \ln c - 5 \ln d$$

- a)  $\ln\left(\frac{a}{bc^3d^5}\right)$     b)  $\ln\left(\frac{ac^3}{bd^5}\right)$   
 c)  $\ln\left(\frac{ab}{c^3d^5}\right)$     d)  $\ln\left(\frac{b}{ac^3d^5}\right)$

10. Solve the following logarithmic equation.

$$3 \ln(x + 1) = 120$$

- a)  $e^{40} - 1$     b)  $e^{120} - 1$   
 c)  $e^{120} - 3$     d)  $e^{40} - 3$