Quiz #10

Name: **Key**

> READ AND FOLLOW ALL DIRECTIONS. CIRCLE YOUR FINAL ANSWERS.
> SHOW ALL WORK TO RECEIVE FULL CREDIT. NO CALCULATORS.

1. (4 points) Change each exponential expression to an equivalent expression involving a logarithm.

   (a) $a^3 = 2.1$

   $$\log_a 2.1 = 3$$

   (b) $2^x = 7.2$

   $$\log_2 7.2 = x$$

2. (4 points) Change each logarithmic expression to an equivalent expression involving an exponent.

   (a) $\log_3 2 = x$

   $$3^x = 2$$

   (b) $\log_a 4 = 2$

   $$a^2 = 4$$

3. (4 points) Find the exact value of each of the following expressions.

   (a) $\log_2 (2^{-13}) = -13$

   (b) $e^{\ln 16} = e^{\log_e 16} = 16$

Quiz #10

4. (8 points) ~~Write each expression as a sum and/or difference of logarithms. Express powers as factors.~~ write each expression as a single logarithm

   (a) $2\log_6 u + 3\log_6 v$

   $$= \log_6 u^2 + \log_6 v^3$$

   $$= \log_6 (u^2 \cdot v^3)$$

   (b) $\log(x^2 - 1) - 2\log(x + 1)$

   $$= \log(x^2 - 1) - \log(x + 1)^2$$

   $$= \log \frac{x^2 - 1}{(x + 1)^2}$$

5. (2 points) EXTRA CREDIT. Does $3^{\log_3(-5)} = -5$? Why or why not?

   No. $\log_3(-5)$ is undefined, since the domain of $\log_3 x$ is $x > 0$.