**Homework 2.2: Exponential & Logarithmic Forms, Properties of Logs & Change of Base**

**Directions:** Write each equation in logarithmic form.

1. $9^2 = 81$ $\log_9 81 = 2$

2. $\frac{1}{64} = \left(\frac{1}{4}\right)^3$ $\log_{1/4} \frac{1}{64} = 3$

3. $10^{-3} = 0.001$ $\log .001 = -3$

4. $\left(\frac{1}{3}\right)^{-2} = 9$ $\log_{1/3} 9 = -2$

5. $8^3 = 512$ $\log_8 512 = 3$

6. $81 = 243^{\frac{4}{5}}$ $\log_{243} 81 = \frac{4}{5}$

**Directions:** Write each equation in exponential form.

1. $\log_2 8 = 3$ $2^3 = 8$

2. $\log_{243} 27 = \frac{3}{5}$ $243^{3/5} = 27$

3. $\log_5 625 = 4$ $5^4 = 625$

4. $\log_3 \frac{1}{81} = -4$ $3^{-4} = \frac{1}{81}$

5. $\log_2(32) = 5$ $2^5 = 32$

6. $\log 100{,}000 = 5$ $10^5 = 100{,}000$

**Directions:** Evaluate each logarithm.

1. $\log_5 125$ $= 3$

2. $\log_{12} 12$ $= 1$

3. $\log_7 7^8$ $= 8$

4. $\log_{16} 1$ $= 0$

5. $\log 2$ $10^x = 2$ $x = .301$

6. $6^{\log_6 7}$ $= 7$