Name: _____ Date: _____

BLM 7–4

Section 7.2 Zero and Negative Exponents

1. Write each expression as a power with a negative exponent.

a) $\frac{1}{6^3}$ **b)** $\frac{1}{4^2}$

c) $\frac{1}{9^8}$ **d)** $\frac{1}{8^2}$

2. Write each power as an expression with a positive exponent.

a) 3^{-4} **b)** 7^{-6}

c) 2^{-1} **d)** 5^{-6}

3. Evaluate. Express your answers as whole numbers or fractions.

a) 3^2 3^{-2}

b) 5^3 5^{-3}

c) 10^4 10^{-4}

d) $(-3)^3$ $(-3)^{-3}$

4. Evaluate.

a) $(-10)^{-2}$ **b)** $(-4)^{-3}$

c) $\left(\frac{1}{4}\right)^{-4}$ **d)** $\left(\frac{1}{3}\right)^{-3}$

5. Write each expression as a single power. Then, evaluate.

a) $8^4 \times 8^{-2}$ **b)** $\frac{4^2}{4^3}$

c) $\left(\frac{1}{3}\right)^{-5} \times \left(\frac{1}{3}\right)^{7}$ **d)** $\frac{1}{(3^2)^2}$

e) $(2^{-5})^2$ **f)** $\frac{5^4}{5^{-2}}$

g) $\left(\frac{1}{4}\right)^{-5}\left(\frac{1}{4}\right)^{3}$ **h)** $(-5)^4(-5)^{-2}$

i) $(4^{-3})^2$ **j)** $\left(-\frac{1}{3}\right)^{5}\left(-\frac{1}{3}\right)^{-7}$

6. A radioactive material decays by 2^{-1} of its original mass in 8 h. How much of a 200-mg sample would remain after

a) 1 day?

b) 3 days?

7. Refer to question 6. Would the amount of radioactive material ever reach 0 mg? Explain.

8. Use each indicated base to write each numerator and denominator as a power. Then, simplify. Express your answer as a power with a whole number base.

a) $\frac{625}{125}$ base 5

b) $\frac{256}{16}$ base 4

c) $\frac{6561}{243}$ base 3

d) $\frac{343}{49}$ base 7

9. Use examples to explain the meaning of a power with exponent zero.