Name _____ Date _____

8-3 Skills Practice: *Define and Use Zero & Negative Exponents* **Alg 1**

1. Evaluate the expression. Write your answer using exponents.

a. 3^{-5} **b.** 10^{-3} **c.** $(-2)^{-6}$

d. 5^{0} **e.** $(-6)^{0}$ **f.** $\left(\frac{4}{3}\right)^{0}$

g. $\left(\frac{5}{8}\right)^{-2}$ **h.** $\left(\frac{7}{4}\right)^{3}$ **i.** 0^{-5}

j. $10^{-5} \cdot 10^{-3}$ **k.** $4^{-6} \cdot 4^{3}$ **l.** $\frac{1}{5^{-4}}$

2. Simplify the expression.

a. x^{-7} **b.** $6y^{-4}$ **c.** $(2b)^{-5}$

d. $(-3m)^{-4}$ **e.** $a^{2}b^{-4}$ **f.** $3x^{-2}y^{-5}$

g. $(4x^{-4}y^{2})^{-3}$ **h.** $(8mn^{3})^{0}$ **i.** $\frac{c^{-3}}{d^{-5}}$

j. $\frac{x^{2}}{y^{-4}}$ **k.** $\frac{x^{-6}}{4y^{5}}$ **l.** $\frac{1}{3x^{-3}y^{-7}}$

3. A sheet of 67 -pound paper has a thickness of 100^{-1} inch.

a. Write and evaluate an expression for the total thickness of 5 sheets of 67-pound paper.

b. Write and evaluate an expression for the total thickness of 23 sheets of 67-pound paper.

4. A frog egg currently has a radius of 5^{-1} centimeter. Write an expression for the volume of the frog egg. Use the formula for the volume of a sphere: $V = \frac{4}{3}\pi r^2$

5. The metric system has name~ for very small lengths.

a. One micrometer is 10^3 times the length of one nanometer. One nanometer is 10^{-9} meter. Write one micrometer in meters.

b. One femtometer is 10^3 times the length of one attometer. One attometer is 10^{-18} meter. Write one femtometer in meters.

c. One centimeter is 10^{10} times the length of one picometer. One picometer is 10^{-12} meter. Write one centimeter in meters.