Mth 098 – Intermediate Algebra – **Practice Exam 1**

NOTE: This exam should not be taken as a complete list of possible problems. It is merely intended to be an example of the difficulty level of the regular exam. To best utilize it as a *practice* exam, try to complete the exam without notes or distractions. Try to emulate the classroom environment as much as possible.

1. List the set $A = \{x \mid x < 5 \text{ and } x \in N\}$ in roster form.

2. Consider the set $\left\{5, -2.75, \sqrt{2}, -3, 0, \frac{5}{9}\right\}$. List the elements that are:

   a. natural numbers.

   b. integers.

   c. rational numbers.

   d. irrational numbers.

   e. real numbers.

3. Given $A = \{1, 2, 3, 4, 5\}$ and $B = \{2, 4, 6, 8\}$, find:

   a. $A \cup B$

   b. $A \cap B$

4. Illustrate the set $\{r \mid -2 \le r < 5\}$ on a number line.

5. Evaluate each problem.

a. $|-4|-|-4|-|-4-4|$

b. $-|8|\cdot\left|\frac{-1}{2}\right|$

c. $-\frac{1}{8}+\left(-\frac{1}{16}\right)$

d. -4^2

e. $\sqrt[3]{-27}$

f. $4\cdot 3\div 6-2^2$

g. $2[4-2(-3)]^2$

h. 2^{-3}

i. -5^{-2}

6. Simplify each expression and write the answer without negative exponents.

a. $2x^{-3}$

b. $\left(-7v^{4}\right)\left(-3v^{-5}\right)$

c. $\dfrac{6x^{-2}y^{3}z^{-2}}{-2x^{4}y}$

d. $-3\left(x^{-3}\right)^{2}$

e. $\left(4s^{-3}t^{-4}\right)^{2}$

f. $\left(\dfrac{3x^{-2}}{xy}\right)^{-2}$

g. $\left(\dfrac{24x^{32}y^{-3}z^{4}}{3x^{14}y^{-7}z}\right)^{0}$

7. Express each number in scientific notation.

   a. 5,260,000,000

   b. 0.000 00556

8. Express each number without exponents.

   a. 5.78×10^{6}

   b. 2.4×10^{-4}

9. A light-year is the distance that light can travel in one year. It is approximately 9.5×10^{12} km. If the Milky Way galaxy is approximately 1.5×10^{5} light years across, how many kilometers wide is it? (Leave your answer in scientific notation.)