Exam 1 Review

Note: This is not a complete list of topics – you should study your lecture notes and homework in addition to reviewing the items listed here.

1. vocabulary
   a. set
   b. elements
   c. roster form
   d. set-builder notation
   e. subset
   f. union
   g. intersection
2. important sets
   a. $\Re = \{x \mid x \text{ is a point on the number line } \}$
   b. $\varnothing = \{\ \} =$ empty set (or null set)
   c. $N = \{1, 2, 3, \ldots\}$
   d. $W = \{0, 1, 2, 3, \ldots\}$
   e. $I = \{\ldots -3, -2, -1, 0, 1, 2, 3, \ldots\}$
   f. $Q = \left\{\frac{p}{q} \mid p, q \in I \text{ and } q \neq 0\right\}$
   g. $H = \{x \mid x \text{ is a real number that is not a rational number } \}$
3. absolute value
   a. $|a| = \begin{cases} a, a \geq 0 \\ -a, a < 0 \end{cases}$
4. radicals and roots
5. order of operations (PEMDAS)
6. exponent rules
   a. $a^0 = 1, \quad a \neq 0$
   b. $a^{-n} = \frac{1}{a^n}, \quad a \neq 0$
   c. $a^m \cdot a^n = a^{m+n}$
   d. $\left(a^m\right)^n = a^{n \cdot m}$
   e. $\frac{a^m}{a^n} = a^{m-n}, \quad a \neq 0$
   f. $(ab)^n = a^n b^n$
   g. $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, \quad b \neq 0$
7. scientific notation: $a \times 10^n, 1 \leq a < 10$, n an integer