1.6 ABSOLUTE VALUE EQUATIONS

1. **Definition:** $|x|$ – the distance of the number from zero.
   Example: $|x| = 3$

2. **Solving an Absolute Value Equation:**

a. Isolate the absolute value. (write the equation in this form $|x| = a$).

b. No solution if $a < 0$. Otherwise, $x = a$ or $x = -a$.

c. Solve and check the solution.

Example 1: Solve the equation:

a. $|x| = 5$ b. $|x| = -6$ c. $|2w - 3| = 5$

Your Turn:
d. $|y| = 7$ e. $|2y - 6| + 6 = 2$ f. $|w| - 2 = 12$

3. **Solving Equations Containing Two Absolute Value:**

$$|x| = |y| \text{ implies that } x = y \text{ or } x = -y$$

Example 2: Solve the equation:

a. $|2w - 3| = |5w + 1|$ **Your Turn:** b. $|x - 4| = |x + 8|$