Worksheet #15   **Answers**

1) $\sqrt{2x} = 10$.
   $2x = 100$
   $x = 50$
   ch: $\sqrt{2(50)} - 10 = 0$
   $\sqrt{100} - 10 = 0$
   $0 = 0$ ✓

2) $\sqrt{5 - x} = 3$
   $5 - x = 9$
   $-x = 4$
   $x = -4$
   ch: $\sqrt{5 - (-4)} - 3 = 0$
   $\sqrt{9} - 3 = 0$
   $0 = 0$ ✓

3) $\sqrt[3]{2x + 5} = -3$
   $2x + 5 = -27$
   $2x = -32$
   $x = -16$
   ch: $\sqrt[3]{2(-16) + 5} + 3 = 0$
   $\sqrt[3]{-27} + 3 = 0$
   $-3 + 3 = 0$
   $0 = 0$ ✓

4) $\sqrt[3]{3x + 1} = 5$
   $3x + 1 = 125$
   $3x = 124$
   $x = 124/3$
   ch: $\sqrt[3]{3(124/3) + 1} - 5 = 0$
   $\sqrt[3]{125} - 5 = 0$
   $0 = 0$ ✓

5) $x + 5 = x - 5$
   $0 = 0$
   $x = \{ \}$

6) $\sqrt{x - 20} = 10 - \sqrt{x}$
   $x - 20 = 100 - 20\sqrt{x} + x$
   $-20 = 100 - 20\sqrt{x}$
   $-120 = -20\sqrt{x}$
   $6 = \sqrt{x}$
   $36 = x$
   ch: $\sqrt{(36)} + \sqrt{(36) - 20} = 10$
   $6 + 4 = 10$
   $10 = 10$

7) $3x + 2 = 7$ | $3x + 2 = -7$
   $3x = 5$ $3x = -9$
   $x = 5/3$ $x = -3$
   ch: $|3(5/3) + 2| = 7$ | $|3(-3) + 2| = -7$
   $|5 + 2| = 7$ $|-9 + 2| = -7$
   $7 = 7$ $7 \neq -7$
   $x = \{5/3\}$

8) $x = x^2 + x - 3$ | $-x = x^2 + x - 3$
   $0 = x^2 - 3$ $0 = x^2 + 2x - 3$
   $3 = x^2$ $(x + 3)(x - 1) = 0$
   $x = \pm\sqrt{3}$ $x = \{-3, 1\}$
   ch: $|\sqrt{3}| = 3 + \sqrt{3} - 3$
   $\sqrt{3} = \sqrt{3}$
   $|-\sqrt{3}| = 3 - \sqrt{3} - 3$
   $\sqrt{3} \neq -\sqrt{3}$
   $|-3| = 9 - 3 - 3$ $|1| = 1 + 1 - 3$
   $3 = 3$ $1 \neq -1$
   $x = \{\sqrt{3}, 3\}$

9) decreases: $-\infty < x < -1$
   increases: $-1 < x \leq 4$

10) increases: $-\infty < x \leq 1$