

Absolute Value Equations

To solve $|A| = B$
(Note: $B \geq 0$)

we solve

$$\boxed{A = B}$$

and

$$\boxed{A = -B}$$

48.

$$|5x - 7| = 2$$

$$5x - 7 = 2$$

$$\underline{+7 \quad +7}$$

$$\frac{5x}{5} = \frac{9}{5}$$

$$\boxed{x = \frac{9}{5}} \quad \checkmark$$

$$5x - 7 = -2$$

$$\underline{+7 \quad +7}$$

$$\frac{5x}{5} = \frac{5}{5}$$

$$\boxed{x = 1} \quad \checkmark$$

49.

$$|4x - 5| + 18 = 13$$

$$|4x - 5| + 18 = 13$$

$$\underline{-18 \quad -18}$$

↓

$$|4x - 5| = -5 \quad B \leq 0$$

No Solutions

$$4x - 5 + 18 = -13$$

50. $|x^2 - 6x| = 27$

$$\begin{array}{r} x^2 - 6x = 27 \\ -27 \quad -27 \\ \hline \end{array}$$

$$\downarrow$$

$$x^2 - 6x - 27 = 0$$

$$\downarrow$$

$$(x+3)(x-9) = 0 \quad \begin{array}{l} 9 \cdot 3 = 27 \\ 3 - 9 = -6 \end{array}$$

$$\downarrow$$

$$\begin{array}{r} x+3=0 \\ -3 \quad -3 \\ \hline \boxed{x = -3} \end{array} \quad \begin{array}{r} x-9=0 \\ +9 \quad +9 \\ \hline \boxed{x = 9} \end{array}$$

$$\begin{array}{r} x^2 - 6x = -27 \\ +27 \quad +27 \\ \hline \end{array}$$

$$\downarrow$$

$$x^2 - 6x + 27 = 0$$

$$\downarrow$$

$$(x-9)(x-3) = 0$$

$$-9, 3 \quad 3, -9$$

51. $|15x - 5| = |35 - 5x|$

$$\downarrow$$

$$\begin{array}{r} 15x - 5 = 35 - 5x \\ +5x \quad +5x \\ \hline \end{array}$$

$$\downarrow$$

$$\begin{array}{r} 15x - 5 + 5x = 35 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\downarrow$$

$$15x + 5x = 35 + 5$$

$$\downarrow$$

$$\begin{array}{r} 20x = 40 \\ 20 \quad 20 \\ \hline \end{array}$$

$$\downarrow$$

$$\boxed{x = 2}$$

$$15x - 5 = -(35 - 5x)$$

$$\downarrow$$

$$\begin{array}{r} 15x - 5 = -35 + 5x \\ -5x \quad -5x \\ \hline \end{array}$$

$$\downarrow$$

$$\begin{array}{r} 15x - 5x - 5 = -35 \\ +5 \quad +5 \\ \hline \end{array}$$

$$15x - 5x = -30$$

$$\downarrow$$

$$\begin{array}{r} 10x = -30 \\ 10 \quad 10 \\ \hline \end{array}$$

$$\downarrow$$

$$\boxed{x = -3}$$