

## ☺ Chapter 4 Notes ☺

### 4.0 – Solving Equations

#### Equations with Absolute Values:

**Example 1:** Solve  $5|a-2|=12$ .

$$\begin{aligned} |a-2| &= 2\frac{2}{5} \\ a-2 &= 2\frac{2}{5} & a-2 &= -2\frac{2}{5} \\ +2 &+2 & +2 &+2 \\ a &= 4\frac{2}{5} & a &= -\frac{2}{5} \end{aligned}$$

**Example 2:** Solve  $-3|x+11|=-7$

$$|x+11| = 2\frac{1}{3}$$

$$\begin{aligned} x+11 &= 2\frac{1}{3} & x+11 &= -2\frac{1}{3} \\ -11 &-11 & -11 &-11 \\ x &= -8\frac{2}{3} & x &= -13\frac{1}{3} \end{aligned}$$

**Example 3:**  $-4|y-9|=50$

$$|y-9| = -12\frac{1}{2}$$

NO SOLUTION - ABSOLUTE VALUE  
CANNOT BE NEGATIVE

#### Equations with Squares:

**Example 4:** Solve  $7(x-5)^2=847$

$$(x-5)^2 = 121$$

$$\sqrt{(x-5)^2} = \sqrt{121}$$

$$x-5 = \pm 11$$

$$\begin{aligned} x-5 &= 11 \\ +5 &+5 \\ x &= 16 \end{aligned}$$

$$\begin{aligned} x-5 &= -11 \\ +5 &+5 \\ x &= -6 \end{aligned}$$

**Example 5:** Solve  $(x+1)^2 = -100$

NO SOLUTION  $\Rightarrow$  NOTHING SQUARED  
YIELDS A NEGATIVE NUMBER

## ☺ Chapter 4 Notes ☺

**Example 6:** Solve  $8 + 2(b-6)^2 = 26$

$$\begin{aligned} & -8 \qquad -8 \\ & \frac{2(b-6)^2 = 18}{2} \qquad \frac{2}{2} \\ & \sqrt{(b-6)^2} = \sqrt{9} \\ & b-6 = \pm 3 \end{aligned}$$

$$\begin{array}{l} b-6 = 3 \\ +6 \quad +6 \\ \hline b = 9 \end{array} \qquad \begin{array}{l} b-6 = -3 \\ +6 \quad +6 \\ \hline b = 3 \end{array}$$

### Equations with Square Roots:

**Example 7:** Solve  $\sqrt{c+3} = 9$

$$\begin{aligned} & (\sqrt{c+3})^2 = 9^2 \\ & c+3 = 81 \\ & -3 \quad -3 \\ & c = 78 \end{aligned}$$

**Example 8:** Solve  $4\sqrt{x-3} + 15 = 14$

$$\begin{aligned} & -15 \quad -15 \\ & \frac{4\sqrt{x-3}}{4} = \frac{-1}{4} \\ & \sqrt{x-3} = -\frac{1}{4} \end{aligned}$$

NO SOLUTION  $\rightarrow$  PRINCIPAL SQUARE  
ROOT IS ALWAYS POSITIVE