5.2 Addition and Subtraction Equations

Addition and subtraction are <u>INVERSE</u> <u>OPERATIONS</u>, which means that they undo each other.

Subtraction undoes addition. Use the Subtraction Property of Equality to keep the two sides of the equation balanced.

Addition undoes subtraction. Use the Addition Property of Equality to keep the two sides of the equation balanced.

Example: Solve. Identify whether you used the Addition Property of Equality or the Subtraction Property of Equality.

1.) $x + 13 = 55$
$-13 \quad -13$

$x = 55 - 13$

$\boxed{x = 42}$

Subtraction Prop. of Equality

2.) $m - 72 = 155$
$+72 \quad +72$

$m = 155 + 72$

$\boxed{m = 227}$

Addition Prop. of Equality

3.) $20.34 + b = 200$
$-20.34 \quad -20.34$

$b = 200 - 20.34$

$\begin{array}{r} 200.00 \\ - 20.34 \\ \hline 179.66 \end{array}$

$\boxed{b = 179.66}$

Subtraction Prop. of Equality

Example: Solve each equation.

$$\begin{array}{r} 7.5 \\ +\ 4.5 \\ \hline 12.0 \end{array}$$

4.) $61 + \boxed{x} = 207$
$-61 \qquad -61$
$x = 207 - 61$
$$\boxed{x = 146}$$

5.) $f - 108 = \bigcirc{7.5 + 4.5}$
$f - 108 = 12$
$+108 \quad +108$
$f = 12 + 108$
$$\boxed{f = 120}$$

6.) $30.8 = \boxed{m} - 22.1$
$+22.1 \qquad +22.1$
$30.8 + 22.1 = m$
$$\boxed{52.9 = m}$$

7.) $148 = \boxed{12.6} + p \boxed{+\ 5.25}$
$148 = \boxed{17.85} \boxed{+p}$
$-17.85 \quad -17.85$
$148 - 17.85 = p$
$$\boxed{130.15 = p}$$

$$\begin{array}{r} 12.60 \\ +\ 5.25 \\ \hline 17.85 \end{array}$$

$$\begin{array}{r} 14\overset{7}{\cancel{8}}.\overset{9}{\cancel{0}}\overset{10}{\cancel{0}} \\ -\ 17.85 \\ \hline 130.15 \end{array}$$

8.) $m - 17.3 = \boxed{9.4 + 3.2}$
$\boxed{m} - 17.3 = 12.6$
$+17.3 \quad +17.3$
$m = 12.6 + 17.3$
$$\boxed{m = 29.9}$$

$$\begin{array}{r} 9.4 \\ +\ 3.2 \\ \hline 12.6 \end{array}$$

Example: Write and solve an equation.

$$\begin{array}{r} {}^{13}\\ {}_{4}\cancel{5}\overset{4}{\cancel{4}}.\overset{13}{\cancel{3}} \\ -\ 47.5 \\ \hline 6.8 \end{array}$$

9.) A number added to 47.5 equals 54.3.

$\boxed{x} + 47.5 = 54.3$
$-47.5 \quad -47.5$
$x = 54.3 - 47.5$
$$\boxed{x = 6.8}$$

10.) Five less than a number is equal to eighty-three.

$\boxed{n} - 5 = 83$
$+5 \qquad +5$
$n = 83 + 5$
$$\boxed{n = 88}$$

Example: Write and solve an equation.

11.) 12 less than a number is equal to 100.

$$n - 12 = 100$$
$$+12 \quad +12$$
$$n = 100 + 12$$

$$\boxed{n = 112}$$

12.) A number increased by 15.2 is equal to 18.7.

$$n + 15.2 = 18.7$$
$$- 15.2 \quad -15.2$$
$$n = 18.7 - 15.2$$

$$\boxed{n = 3.5}$$

13.) There are 150 people at a concert. The ticket sales show that 95 of the attendees are students and the rest are parents. Write an addition equation to show the situation and find how many parents are at the concert.