Exercise. 7.2 (Solution)

9th Class

2. ■ *Solve the following equations.*

i) $\left| 3x - 5 \right| = 4$

(Solution): $\left| 3x - 5 \right| = 4$

$3x - 5 = 4$	$3x - 5 = -4$
$3x = 4 + 5$	$3x = -4 + 5$
$3x = 9$	$3x = 1$
$x = 3$	$x = \dfrac{1}{3}$

$$3x - 5 = \pm 4$$

$$\textbf{\textit{Solution Set}} = \left\{ \frac{1}{3}, 3 \right\}$$

ii) $\dfrac{1}{2} \left| 3x + 2 \right| - 4 = 11$

(Solution): $\left| \dfrac{3x+2}{2} \right| = 11 + 4$

$$\left| \frac{3x+2}{2} \right| = 15$$

$$2 \times \frac{\left| 3x+2 \right|}{2} = 15 \times 2$$

$$|3x + 2| = 30$$
$$3x + 2 = \pm 30$$

$3x + 2 = 30$	$3x + 2 = -30$
$3x = 30 - 2$	$3x = -30 - 2$
$3x = 28$	$3x = -32$
$x = \dfrac{28}{3}$	$x = \dfrac{-32}{3}$

$$\textbf{Solution Set} = \left\{\frac{28}{3}, \frac{-32}{3}\right\}$$

iii) $\quad |2x + 5| = 11$

(Solution): $\quad 2x + 5 = \pm 11$

$2x + 5 = 11$	$2x + 5 = -11$
$2x = 11 - 5$	$2x = -11 - 5$
$2x = 6$	$2x = -16$
$x = \dfrac{6}{2}$	$x = \dfrac{-16}{2}$
$x = 3$	$x = -8$

$$\textbf{Solution Set} = \{-8, 3\}$$

iv) $\quad |3 + 2x| = |6x - 7|$

(Solution): $3x + 2 = \pm 6x - 7$

$3 + 2x = 6x - 7$	$3 + 2x = -(6x - 7)$
$3 + 7 = 6x - 2x$	$3 + 2x = -6x + 7$
$10 = 4x$	$3 - 7 = -6x - 2x$
$4x = 10$	$-8x = -4$
$x = \dfrac{10}{4}$	$x = \dfrac{4}{8}$
$x = \left\{\dfrac{5}{2}\right\}$	$x = \left\{\dfrac{1}{2}\right\}$

$$Solution\ Set = \left\{\dfrac{5}{2}, \dfrac{1}{2}\right\}$$

v) $\left| x + 2 \right| - 3 = 5 - \left| x + 2 \right|$

(Solution): $\left| x + 2 \right| + \left| x + 2 \right| = 5 + 3$

$$2\left| x + 2 \right| = 8$$

$$\left| x + 2 \right| = 4$$

$$x + 2 = \pm 4$$

$x + 2 = 4$	$x + 2 = -4$
$x = 4 - 2$	$x = -4 - 2$
$x = 2$	$x = -6$

$$Solution\ Set = \{2, -6\}$$

vi) $\frac{1}{2}\left|x+3\right|+21=9$

(Solution): $\frac{1}{2}\left|x+3\right|=9-21$

$$\frac{1}{2}\left|x+3\right|=-12$$

Solution Set is not possible.

vii) $\left|\frac{3-5x}{4}\right|-\frac{1}{3}=\frac{2}{3}$

(Solution): $\left|\frac{3-5x}{4}\right|=\frac{2}{3}+\frac{1}{3}$

$$\left|\frac{3-5x}{4}\right|=\frac{2+1}{3}$$

$$\left|\frac{3-5x}{4}\right|=1$$

$$\frac{3-5x}{4}=\pm 1$$

$$\frac{3-5x}{4}=1 \qquad\qquad \frac{3-5x}{4}=-1$$

$$3-5x=4 \qquad\qquad\quad 3-5x=-4$$

$$-5x=4-3 \qquad\qquad -5x=-4-3$$

$$-5x = 1 \qquad\qquad -5x = -7$$

$$x = \frac{-1}{5} \qquad\qquad x = \frac{7}{5}$$

$$Solution\ Set = \left\{\frac{-1}{5}, \frac{7}{5}\right\}$$

viii) $\left|\frac{x+5}{2-x}\right| = 6$

(Solution): $\left|\frac{x+5}{2-x}\right| = 6$

$$\frac{x+5}{2-x} = \pm 6$$

$$\frac{x+5}{2-x} = 6 \qquad\qquad \frac{x+5}{2-x} = -6$$

$$x + 5 = 6(2-x) \qquad\qquad x + 5 = -6(2-x)$$

$$x + 5 = 12 - 6x \qquad\qquad x + 5 = -12 + 6x$$

$$x + 6x = 12 - 5 \qquad\qquad x - 6x = -12 - 5$$

$$7x = 7 \qquad\qquad -5x = -17$$

$$x = \frac{17}{5}$$

$$x = 1$$

$$Solution\ Set = \left\{1, \frac{17}{5}\right\}$$

Do good, have good.