Effective Education Makes Gems out of stones

THE
Paragon Academy

② (i)

$$|3x - 5| = 4$$

in equation

$$(3x - 5) = 4 \quad \text{or} \quad -(3x - 5) = 4$$

$$\text{or} \quad 3x - 5 = -4$$

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

$$3x = 9 \qquad\qquad 3x = 1$$

$$x = \frac{9\ 3}{3} \qquad\qquad x = \frac{1}{3}$$

$$x = 3$$

$$\text{S.S} \{ 3 \text{ or } \frac{1}{3} \}$$

Absolute value equation

$$|3x| + 3 = 0$$

$$|3x|$$

$$|5| = 5$$

$$|-5| = 5$$

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

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

$\dfrac{1}{2}\left|3x+2\right|=15$

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

$3x+2=-30$

$3x=-30-2$

$3x=-32$

$x=-\dfrac{32}{3}$

$\left|3x+2\right|=30$

$3x+2=30 \qquad \text{or} \qquad -(3x+2)=30$

$3x=30-2$

$3x=28 \implies x=\dfrac{28}{3}$

$S.S\left\{\dfrac{28}{3}\ \text{or}\ -\dfrac{32}{3}\right\}$

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

$2x+5 = 11 \qquad$ or $\qquad -(2x+5) = 11$

$2x = 11-5 \qquad$ or $\qquad 2x+5 = -11$

$2x = 6 \qquad\qquad\qquad\qquad 2x = -11-5$

$x = \dfrac{\cancel{6}^{3}}{\cancel{2}} \qquad\qquad\qquad\quad 2x = -16$

$x = 3 \qquad\qquad\qquad\qquad x = -\dfrac{\cancel{16}^{8}}{\cancel{2}}$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad x = -8$

$\text{S.S} \{ 3, -8 \}$

iv) $\;\cancel{3x}\;|3+2x| = |6x-7|$

$$\frac{|3+2x|}{|6x-7|} = 1$$

$$\left|\frac{3+2x}{6x-7}\right| = 1$$

$$\frac{3+2x}{6x-7} = 1$$

$3\cancel{x}+2x = 6x-7$

$2x-6x = -7-3$

$\cancel{-}4x = \cancel{-}10^{\,5}$

$x = \dfrac{\cancel{10}^{\,5}}{\cancel{4}_{2}}$

$,\quad -\left(\dfrac{3+2x}{6x-7}\right) = 1$

$\dfrac{3+2x}{6x-7} = -1$

$3+2x = -6x+7$

$2x+6x = 7-3$

$8x = 4$

$8x = 4$

$x = \dfrac{\cancel{4}^{\,1}}{\cancel{8}_{2}}$

$x = \dfrac{5}{2} \;\; or \;\; x = \dfrac{1}{2}$

$==$

v) $|x+2| - 3 = 5 - |x+2|$

$|x+2| + |x+2| = 5 + 3$

$2|x+2| = 8$

$|x+2| = \dfrac{\cancel{8}^{4}}{\cancel{2}}$

$|x+2| = 4$

$x + 2 = 4$ or $-(x+2) = 4$

$x = 4 - 2$ $\qquad$ $x + 2 = -4$

$x = 2$ $\qquad\qquad$ $x = -4 - 2$

$\qquad\qquad\qquad\qquad x = -6$

$x = 2$ or $x = -6$

vi) $\quad \dfrac{1}{2}|x+3| + 21 = 9$

$\dfrac{1}{2}|x+3| = 9 - 21$

$\dfrac{1}{2}|x+3| = -12$

Absolute value equation can not be equal to a Negative Number

so

$\varphi =$

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

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

$\left|\dfrac{3-5x}{4}\right| = \dfrac{\cancel{3}^{1}}{\cancel{3}}$

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

$\dfrac{3-5x}{4} = 1 \qquad \text{or} \qquad -\left(\dfrac{3-5x}{4}\right) = 1$

$3 - 5x = 4 \qquad \text{or} \qquad \dfrac{3-5x}{4} = -1$

$3 - 5x = 4 \qquad\qquad \text{or} \qquad \dfrac{3-5x}{4} = -1$

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

$-5x = 1 \qquad\qquad 3 - 5x = -4$

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

$x = -\dfrac{1}{5} \qquad\qquad \cancel{-5}x = \cancel{-}7$

$\qquad\qquad\qquad\qquad x = \dfrac{7}{5}$

$x = -\dfrac{1}{5} \qquad \text{or} \qquad x = \dfrac{7}{5}$

$\underline{\quad\quad}$

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

$\dfrac{x+5}{2-x} = 6$  or  $-\left(\dfrac{x+5}{2-x}\right) = 6$

$x+5 = 12 - 6x$  or  $\dfrac{x+5}{2-x} = -6$

$x + 6x = 12 - 5$  $\qquad$ $x+5 = -6(2-x)$

$7x = 7$  $\qquad$ $x+5 = -12 + 6x$

$x = \dfrac{17}{7}$  $\qquad$ $x - 6x = -12 - 5$

$x = 1$  $\qquad$ $-5x = -17$

$\qquad$ $x = \dfrac{17}{5}$

$x = 1$  or  $x = \dfrac{17}{5}$