

Topic 1 // 2.8 Prac // Practice D

(1)  $|x-5|=3$

$$\begin{array}{r} \swarrow \\ x-5=3 \\ \underline{+5} \quad \underline{+5} \\ \boxed{x=8} \end{array}$$

$$\begin{array}{r} \searrow \\ x-5=-3 \\ \underline{+5} \quad \underline{+5} \\ \boxed{x=2} \end{array}$$

(2)  $|2x+1|=11$

$$\begin{array}{r} \swarrow \\ 2x+1=11 \\ \underline{-1} \quad \underline{-1} \\ 2x=10 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=5} \end{array}$$

$$\begin{array}{r} \searrow \\ 2x+1=-11 \\ \underline{-1} \quad \underline{-1} \\ 2x=-12 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-6} \end{array}$$

$$\begin{array}{r} 2x=10 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=5} \end{array}$$

$$\begin{array}{r} 2x=-12 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-6} \end{array}$$

(3)  $|\frac{1}{3}x-5|=2$

$$\begin{array}{r} \swarrow \\ \frac{1}{3}x-5=2 \\ \underline{+5} \quad \underline{+5} \\ \frac{1}{3}x=7 \end{array}$$

$$\begin{array}{r} \searrow \\ \frac{1}{3}x-5=-2 \\ \underline{+5} \quad \underline{+5} \\ \frac{1}{3}x=3 \end{array}$$

$$\begin{array}{r} (\frac{3}{1}) \frac{1}{3}x=7 (\frac{3}{1}) \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=21} \end{array}$$

$$\begin{array}{r} (\frac{3}{1}) \frac{1}{3}x=3 (\frac{3}{1}) \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=9} \end{array}$$

~~5~~  $|\frac{x}{7}|=2$

$$\begin{array}{r} \swarrow \\ (\frac{7}{1}) \frac{x}{7}=2 (\frac{7}{1}) \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=14} \end{array}$$

$$\begin{array}{r} \searrow \\ (\frac{7}{1}) \frac{x}{7}=-2 (\frac{7}{1}) \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-14} \end{array}$$

(4)  $|2-x|=7$

$$\begin{array}{r} \swarrow \\ 2-x=7 \\ \underline{-2} \quad \underline{-2} \\ -x=5 \\ \underline{-1} \quad \underline{-1} \\ \boxed{x=-5} \end{array}$$

$$\begin{array}{r} \searrow \\ 2-x=-7 \\ \underline{-2} \quad \underline{-2} \\ -x=-9 \\ \underline{-1} \quad \underline{-1} \\ \boxed{x=9} \end{array}$$

$$\begin{array}{r} -x=5 \\ \underline{-1} \quad \underline{-1} \\ \boxed{x=-5} \end{array}$$

$$\begin{array}{r} -x=-9 \\ \underline{-1} \quad \underline{-1} \\ \boxed{x=9} \end{array}$$

(6)  $|\frac{x+4}{5}|=3$

$$\begin{array}{r} \swarrow \\ (\cancel{5}) \frac{x+4}{5}=3 (5) \\ \underline{\quad} \quad \underline{\quad} \\ x+4=15 \\ \underline{-4} \quad \underline{-4} \\ \boxed{x=11} \end{array}$$

$$\begin{array}{r} \searrow \\ (\cancel{5}) \frac{x+4}{5}=-3 (5) \\ \underline{\quad} \quad \underline{\quad} \\ x+4=-15 \\ \underline{-4} \quad \underline{-4} \\ \boxed{x=-19} \end{array}$$

$$\begin{array}{r} x+4=15 \\ \underline{-4} \quad \underline{-4} \\ \boxed{x=11} \end{array}$$

$$\begin{array}{r} x+4=-15 \\ \underline{-4} \quad \underline{-4} \\ \boxed{x=-19} \end{array}$$

(7)  $|\frac{3x-2}{4}|=6$

$$\begin{array}{r} \swarrow \\ (\cancel{4}) \frac{3x-2}{4}=6 (\cancel{4}) \\ \underline{\quad} \quad \underline{\quad} \\ 3x-2=24 \\ \underline{+2} \quad \underline{+2} \\ 3x=26 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=\frac{26}{3}} \end{array}$$

$$\begin{array}{r} \searrow \\ (\cancel{4}) \frac{3x-2}{4}=-6 (\cancel{4}) \\ \underline{\quad} \quad \underline{\quad} \\ 3x-2=-24 \\ \underline{+2} \quad \underline{+2} \\ 3x=-22 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-\frac{22}{3}} \end{array}$$

$$\begin{array}{r} 3x-2=24 \\ \underline{+2} \quad \underline{+2} \\ 3x=26 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=\frac{26}{3}} \end{array}$$

$$\begin{array}{r} 3x-2=-24 \\ \underline{+2} \quad \underline{+2} \\ 3x=-22 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-\frac{22}{3}} \end{array}$$

$$\begin{array}{r} 3x=26 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=\frac{26}{3}} \end{array}$$

$$\begin{array}{r} 3x=-22 \\ \underline{\quad} \quad \underline{\quad} \\ \boxed{x=-\frac{22}{3}} \end{array}$$

(8)  $|\frac{x-9}{2}|=4 \rightarrow |x-9|=8$

$$\begin{array}{r} \swarrow \\ x-9=8 \\ \underline{+9} \quad \underline{+9} \\ \boxed{x=17} \end{array}$$

$$\begin{array}{r} \searrow \\ x-9=-8 \\ \underline{+9} \quad \underline{+9} \\ \boxed{x=1} \end{array}$$

$$(9.) \frac{2|x-6|}{2} = \frac{8}{2}$$

$$|x-6| = 4$$

$$\begin{array}{l} \leftarrow \\ x-6=4 \\ \underline{+6} \quad \underline{+6} \end{array}$$

$$\boxed{x=10}$$

$$\begin{array}{l} \rightarrow \\ x-6=-4 \\ \underline{+6} \quad \underline{+6} \end{array}$$

$$\boxed{x=2}$$

$$(10.) \frac{|x+5|-1}{+1} = \frac{2}{+1}$$

$$|x+5| = 3$$

$$\begin{array}{l} \leftarrow \\ x+5=3 \\ \underline{-5} \quad \underline{-5} \end{array}$$

$$\boxed{x=-2}$$

$$\begin{array}{l} \rightarrow \\ x+5=-3 \\ \underline{-5} \quad \underline{-5} \end{array}$$

$$\boxed{x=-8}$$

$$(11) \frac{5|2x+4|-1}{+1} = \frac{9}{+1}$$

$$\frac{5|2x+4|}{5} = \frac{10}{5}$$

$$|2x+4| = 2$$

$$\begin{array}{l} \leftarrow \\ 2x+4=2 \\ \underline{-4} \quad \underline{-4} \end{array}$$

$$\frac{2x}{2} = \frac{-2}{2}$$

$$\boxed{x=-1}$$

$$\begin{array}{l} \rightarrow \\ 2x+4=-2 \\ \underline{-4} \quad \underline{-4} \end{array}$$

$$\frac{2x}{2} = \frac{-6}{2}$$

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

$$(12) \frac{10-3|x+2|}{-10} = \frac{-2}{-10}$$

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

$$|x+2| = 4$$

$$\begin{array}{l} \leftarrow \\ x+2=4 \\ \underline{-2} \quad \underline{-2} \end{array}$$

$$\boxed{x=2}$$

$$\begin{array}{l} \rightarrow \\ x+2=-4 \\ \underline{-2} \quad \underline{-2} \end{array}$$

$$\boxed{x=-6}$$

$$(13) |x+6| < 8$$

$$\begin{array}{r} \swarrow \\ x+6 < 8 \\ \underline{-6} \quad \underline{-6} \end{array}$$

$$\boxed{x < 2}$$

$$\begin{array}{r} \searrow \\ x+6 > -8 \\ \underline{-6} \quad \underline{-6} \end{array}$$

$$\boxed{x > -14}$$

$$(14) |3x-2| > 1$$

$$\begin{array}{r} \swarrow \\ 3x-2 > 1 \\ \underline{+2} \quad \underline{+2} \end{array}$$

$$\frac{3x}{3} > \frac{3}{3}$$

$$\boxed{x > 1}$$

$$\begin{array}{r} \searrow \\ 3x-2 < -1 \\ \underline{+2} \quad \underline{+2} \end{array}$$

$$\frac{3x}{3} < \frac{1}{3}$$

$$\boxed{x < \frac{1}{3}}$$

$$(15) \left| \frac{1}{5}x + 1 \right| \leq 6$$

$$\begin{array}{r} \swarrow \\ \frac{1}{5}x + 1 \leq 6 \\ \underline{-1} \quad \underline{-1} \end{array}$$

$$(5) \frac{1}{5}x \leq 5 (5)$$

$$\boxed{x \leq 25}$$

$$\begin{array}{r} \searrow \\ \frac{1}{5}x + 1 \geq -6 \\ \underline{-1} \quad \underline{-1} \end{array}$$

$$(5) \frac{1}{5}x \geq -7 (5)$$

$$\boxed{x \geq -35}$$

$$(16) |6-x| \geq 2$$

$$\begin{array}{r} \swarrow \\ 6-x \geq 2 \\ \underline{-6} \quad \underline{-6} \end{array}$$

$$\frac{-x}{-1} \geq \frac{-4}{-1}$$

$$\boxed{x \leq 4}$$

$$\begin{array}{r} \searrow \\ 6-x \leq -2 \\ \underline{-6} \quad \underline{-6} \end{array}$$

$$\frac{-x}{-1} \leq \frac{-8}{-1}$$

$$\boxed{x \geq 8}$$

$$(17) \left| \frac{x}{10} \right| < 3$$

$$(10) \frac{x}{10} < 3 (10) \quad (10) \frac{x}{10} > -3 (10)$$

$$\boxed{x < 30}$$

$$\boxed{x > -30}$$

$$(18) \left| \frac{x+7}{3} \right| > 9$$

$$(3) \frac{x+7}{3} > 9 (3)$$

$$\begin{array}{r} x+7 > 27 \\ \underline{-7} \quad \underline{-7} \end{array}$$

$$\boxed{x > 20}$$

$$(3) \frac{x+7}{3} < -9 (3)$$

$$\begin{array}{r} x+7 < -27 \\ \underline{-7} \quad \underline{-7} \end{array}$$

$$\boxed{x < -34}$$

$$(19) \left| \frac{4x-5}{2} \right| \leq 4$$

$$(2) \frac{4x-5}{2} \leq 4 \quad (2) \quad (2) \frac{4x-5}{2} \geq -4 \quad (2)$$

$$4x-5 \leq 8$$
$$\begin{array}{r} +5 \\ \hline \end{array}$$

$$\frac{4x}{4} \leq \frac{13}{4}$$

$$\boxed{x \leq \frac{13}{4}}$$

$$4x-5 \geq -8$$
$$\begin{array}{r} +5 \\ \hline \end{array}$$

$$\frac{4x}{4} \geq \frac{-3}{4}$$

$$\boxed{x \geq \frac{-3}{4}}$$

$$(20) \frac{|x-8|}{3} \geq 1 \quad (3)$$

$$|x-8| \geq 3$$

$$x-8 \geq 3$$
$$\begin{array}{r} +8 \\ \hline \end{array}$$

$$\boxed{x \geq 11}$$

$$x-8 \leq -3$$
$$\begin{array}{r} +8 \\ \hline \end{array}$$

$$\boxed{x \leq 5}$$

$$(21) \frac{3|x+9|}{3} < \frac{6}{3}$$

$$|x+9| < 2$$

$$x+9 < 2$$
$$\begin{array}{r} -9 \\ \hline \end{array}$$

$$\boxed{x < -7}$$

$$x+9 > -2$$
$$\begin{array}{r} -9 \\ \hline \end{array}$$

$$\boxed{x > -11}$$

$$(22) \frac{|x-6|+3}{3} > 4$$

$$|x-6| > 1$$

$$x-6 > 1$$
$$\begin{array}{r} +6 \\ \hline \end{array}$$

$$\boxed{x > 7}$$

$$x-6 < -1$$
$$\begin{array}{r} +6 \\ \hline \end{array}$$

$$\boxed{x < 5}$$

$$(23) \frac{6|x+5|-2}{2} \leq 10$$

$$\frac{6|x+5|}{6} \leq \frac{12}{6}$$

$$|x+5| \leq 2$$

$$x+5 \leq 2$$
$$\begin{array}{r} -5 \\ \hline \end{array}$$

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

$$x+5 \geq -2$$
$$\begin{array}{r} -5 \\ \hline \end{array}$$

$$\boxed{x \geq -7}$$

$$(24) \frac{7-2|x+1|}{-2} \geq \frac{-13}{-2}$$

$$\frac{-2|x+1|}{-2} \geq \frac{-20}{-2}$$

$$|x+1| \leq 10$$

$$x+1 \leq 10$$
$$\begin{array}{r} -1 \\ \hline \end{array}$$

$$\boxed{x \leq 9}$$

$$x+1 \geq -10$$
$$\begin{array}{r} -1 \\ \hline \end{array}$$

$$\boxed{x \geq -11}$$