

Topic 1 // Practice D

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

$$\begin{array}{r} x-5=3 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\boxed{x=8}$$

$$\begin{array}{r} x-5=-3 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\boxed{x=2}$$

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

$$\begin{array}{r} 2x+1=11 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$\boxed{x=5}$$

$$\begin{array}{r} 2x+1=-11 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{-12}{2}$$

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

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

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

$$3 \cdot \frac{1}{3}x = 7 \cdot 3$$

$$\boxed{x=21}$$

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

$$3 \cdot \frac{1}{3}x = 3 \cdot 3$$

$$\boxed{x=9}$$

4) $|2-x|=7$

$$\begin{array}{r} 2-x=7 \\ -2 \quad -2 \\ \hline \end{array} \quad \begin{array}{r} 2-x=-7 \\ -2 \quad -2 \\ \hline \end{array}$$

$$(-1) \cdot -x = 5 \quad (-1) \cdot (-1) \cdot -x = -9 \quad (-1)$$

$$\boxed{x=-5}$$

$$\boxed{x=9}$$

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

$$7 \cdot \frac{x}{7} = 2 \cdot 7 \quad 7 \cdot \frac{x}{7} = -2 \cdot 7$$

$$\boxed{x=14}$$

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

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

$$5 \cdot \frac{x+4}{5} = 3 \cdot 5$$

$$\begin{array}{r} x+4=15 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\boxed{x=11}$$

$$5 \cdot \frac{x+4}{5} = -3 \cdot 5$$

$$\begin{array}{r} x+4=-15 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\boxed{x=-19}$$

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

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

$$\begin{array}{r} 3x-2=24 \\ +2 \quad +2 \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{26}{3}$$

$$\boxed{x = \frac{26}{3}}$$

$$\begin{array}{r} 3x-2=-24 \\ +2 \quad +2 \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{-22}{3}$$

$$\boxed{x = \frac{-22}{3}}$$

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

$$|x-9|=8$$

$$\begin{array}{r} x-9=8 \\ +9 \quad +9 \\ \hline \end{array} \quad \begin{array}{r} x-9=-8 \\ +9 \quad +9 \\ \hline \end{array}$$

$$\boxed{x=17}$$

$$\boxed{x=1}$$

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

$$|x-6|=4$$

$$\begin{array}{r} x-6=4 \\ +6 \quad +6 \\ \hline \end{array} \quad \begin{array}{r} x-6=-4 \\ +6 \quad +6 \\ \hline \end{array}$$

$$\boxed{x=10}$$

$$\boxed{x=2}$$

10) $|x+5|=2$

$$\begin{array}{r} x+5=3 \\ -5 \quad -5 \\ \hline \end{array} \quad \begin{array}{r} x+5=-3 \\ -5 \quad -5 \\ \hline \end{array}$$

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

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

11) $5|2x+4|=9$

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

$$\begin{array}{r} |2x+4|=2 \\ 2x+4=2 \\ -4 \quad -4 \\ \hline \end{array} \quad \begin{array}{r} |2x+4|=2 \\ 2x+4=-2 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{-2}{2} \quad \boxed{x=-1}$$

$$\frac{2x}{2} = \frac{-6}{2} \quad \boxed{x=-3}$$

12) $10-3|x+2|=-2$

$$\begin{array}{r} -10 \\ -3|x+2| = -12 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\begin{array}{r} |x+2|=4 \\ x+2=4 \\ -2 \quad -2 \\ \hline \end{array} \quad \begin{array}{r} |x+2|=4 \\ x+2=-4 \\ -2 \quad -2 \\ \hline \end{array}$$

$$\boxed{x=2}$$

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

$$\text{B } 13) |x+6| < 8$$

$$\begin{array}{r} x+6 < 8 \\ -6 \quad -6 \\ \hline x < 2 \end{array}$$

$$\begin{array}{r} x+6 > -8 \\ -6 \quad -6 \\ \hline x > -14 \end{array}$$

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

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

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

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

$$\begin{array}{r} \frac{1}{5}x+1 \leq 6 \\ -1 \quad -1 \\ \hline \frac{1}{5}x \leq 5.5 \\ \hline x \leq 25 \end{array}$$

$$\begin{array}{r} \frac{1}{5}x+1 > -6 \\ -1 \quad -1 \\ \hline \frac{1}{5}x > -7.5 \\ \hline x > -35 \end{array}$$

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

$$\begin{array}{r} 6-x \geq 2 \\ -6 \quad -6 \\ \hline -x \geq -4 \\ (-1) \quad (-1) \\ \hline x \leq 4 \end{array}$$

$$\begin{array}{r} 6-x \leq -2 \\ -6 \quad -6 \\ \hline -x \leq -8 \\ (-1) \quad (-1) \\ \hline x \geq 8 \end{array}$$

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

$$\begin{array}{r} 10 \cdot \frac{x}{10} < 3 \cdot 10 \\ \hline x < 30 \end{array}$$

$$\begin{array}{r} 10 \cdot \frac{x}{10} > -3 \cdot 10 \\ \hline x > -30 \end{array}$$

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

$$\begin{array}{r} 3 \cdot \frac{x+7}{3} > 9 \cdot 3 \\ \hline x+7 > 27 \\ -7 \quad -7 \\ \hline x > 20 \end{array}$$

$$\begin{array}{r} 3 \cdot \frac{x+7}{3} < -9 \cdot 3 \\ \hline x+7 < -27 \\ -7 \quad -7 \\ \hline x < -34 \end{array}$$

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

$$\begin{array}{r} \frac{4x-5}{2} \leq 4 \cdot 2 \\ \hline 4x-5 \leq 8 \\ +5 \quad +5 \\ \hline 4x \leq 13 \\ \hline x \leq \frac{13}{4} \end{array}$$

$$\begin{array}{r} \frac{4x-5}{2} \geq -4 \cdot 2 \\ \hline 4x-5 \geq -8 \\ +5 \quad +5 \\ \hline 4x \geq -3 \\ \hline x \geq -\frac{3}{4} \end{array}$$

$$20) \left| \frac{x-8}{3} \right| \geq 1 \cdot 3$$

$$\begin{array}{r} |x-8| \geq 3 \\ \hline x-8 \geq 3 \\ +8 \quad +8 \\ \hline x \geq 11 \end{array}$$

$$\begin{array}{r} x-8 \leq -3 \\ +8 \quad +8 \\ \hline x \leq 5 \end{array}$$

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

$$\begin{array}{r} |x+9| < 2 \\ \hline x+9 < 2 \\ -9 \quad -9 \\ \hline x < -7 \end{array}$$

$$\begin{array}{r} x+9 > -2 \\ -9 \quad -9 \\ \hline x > -11 \end{array}$$

$$22) |x-6|+3 > 4$$

$$\begin{array}{r} |x-6| > 1 \\ \hline x-6 > 1 \\ +6 \quad +6 \\ \hline x > 7 \end{array}$$

$$\begin{array}{r} x-6 < -1 \\ +6 \quad +6 \\ \hline x < 5 \end{array}$$

$$23) 6|x+5|-2 \leq 10$$

$$\begin{array}{r} 6|x+5| \leq 12 \\ \hline |x+5| \leq 2 \end{array}$$

$$\begin{array}{r} x+5 \leq 2 \\ -5 \quad -5 \\ \hline x \leq -3 \end{array}$$

$$\begin{array}{r} x+5 > -2 \\ -5 \quad -5 \\ \hline x > -7 \end{array}$$

$$24) 7-2|x+1| \geq -13$$

$$\begin{array}{r} -2|x+1| \geq -20 \\ \hline |x+1| \leq 10 \end{array}$$

$$\begin{array}{r} x+1 \leq 10 \\ -1 \quad -1 \\ \hline x \leq 9 \end{array}$$

$$\begin{array}{r} x+1 > -10 \\ -1 \quad -1 \\ \hline x > -11 \end{array}$$