

$$\begin{aligned}
 1. \quad & 5x - \{x - 2[2x - 1 - (x + 8)] - 9\} > 2(x + 3) + 9 \\
 & 5x - \{x - 2[2x - 1 - x - 8] - 9\} > 2x + 6 + 9 \\
 & 5x - \{x - 2(x - 9) - 9\} > 2x + 6 + 9 & 5x - (x - 2x + 18 - 9) > 2x + 6 + 9 \\
 & 5x - (-x + 9) > 2x + 6 + 9 & 5x + x - 9 > 2x + 6 + 9 \\
 & 4x > 24 & x > 6
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & \frac{1}{x-1} + \frac{4}{x^2-x} < 0 & \frac{1}{x-1} + \frac{4}{x(x-1)} < 0 \\
 & \frac{x+4}{x(x-1)} < 0 \\
 & N > 0: \quad x > -4 \\
 & D_1 > 0: \quad x > 0 \\
 & D_2 > 0: \quad x > 1 & x < -4 \vee 0 < x < 1
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & 5x(x+2)(x+3) > 0 \\
 & F_1 > 0: \quad 5x > 0 \Rightarrow x > 0 \\
 & F_2 > 0: \quad x+2 > 0 \Rightarrow x > -2 \\
 & F_3 > 0: \quad x+3 > 0 \Rightarrow x > -3 & -3 < x < -2 \vee x > 0
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & \begin{cases} 3x + 5 < \frac{x}{2} \\ \frac{x+1}{2} + \frac{x-1}{3} > \frac{x}{5} \end{cases} \\
 & A: 6x + 10 < x \Rightarrow 5x < -10 \Rightarrow x < -2 \\
 & B: 15x + 15 + 10x - 10 > 6x \Rightarrow 19x > -5 \Rightarrow x > -\frac{5}{19} & imp.
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & 1 + |2 + 4x| = x \\
 & \begin{cases} x \geq -\frac{1}{2} \\ 1 + 2 + 4x = x \end{cases} & \begin{cases} x \geq -\frac{1}{2} \\ 3x = -3 \end{cases} & \begin{cases} x \geq -\frac{1}{2} \\ x = -1 \end{cases} & imp. \\
 & \begin{cases} x < -\frac{1}{2} \\ 1 - 2 - 4x = x \end{cases} & \begin{cases} x < -\frac{1}{2} \\ -5x = 1 \end{cases} & \begin{cases} x < -\frac{1}{2} \\ x = -\frac{1}{5} \end{cases} & imp.
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & |x| > x + 2 \\
 & \begin{cases} x \geq 0 \\ x > x + 2 \end{cases} & \begin{cases} x \geq 0 \\ 0 > 2 \end{cases} & imp. \\
 & \begin{cases} x < 0 \\ -x > x + 2 \end{cases} & \begin{cases} x < 0 \\ -2x > 2 \end{cases} & \begin{cases} x < 0 \\ x < -1 \end{cases} & x < -1
 \end{aligned}$$