

A

1. $2[3(x-1) - (x-3)] - 21[2x - (3-x) - (3x-7)] < 0$

$$2[3x - 3 - x + 3] - 21[2x - 3 + x - 3x + 7] < 0$$

$$4x - 21 \cdot 4 < 0 \quad x < 21$$

2. $\frac{1}{3} \left(2x + \frac{1}{2} \right) + 2(2x + 3) \geq \frac{37}{6}$

$$\frac{2}{3}x + \frac{1}{6} + 4x + 6 \geq \frac{37}{6}$$

$$\frac{2}{3}x + 4x \geq 6 - 6 \quad x \geq 0$$

3. $\frac{2x-3}{2-x} \geq -3$

$$\frac{2x-3+6-3x}{2-x} \geq 0$$

$$\frac{3-x}{2-x} \geq 0$$

$$N \geq 0: 3-x \geq 0 \Rightarrow x \leq 3$$

$$D > 0: 2-x > 0 \Rightarrow x < 2 \quad x < 2 \vee x \geq 3$$

4. $x^2 + 3x - 54 > 0$

$$(x+9)(x-6) > 0$$

$$F_1 > 0: x+9 > 0 \Rightarrow x > -9$$

$$F_2 > 0: x-6 > 0 \Rightarrow x > 6 \quad x < -9 \vee x > 6$$

5. $(x^2 - 4)(x^2 - 1)(3 - 6x) \leq 0$

$$(x+2)(x-2)(x+1)(x-1)(3-6x) \leq 0$$

$$F_1 \geq 0: x+2 \geq 0 \Rightarrow x \geq -2$$

$$F_2 \geq 0: x-2 \geq 0 \Rightarrow x \geq 2$$

$$F_3 \geq 0: x+1 \geq 0 \Rightarrow x \geq -1$$

$$F_4 \geq 0: x-1 \geq 0 \Rightarrow x \geq 1$$

$$F_5 \geq 0: 3-6x \geq 0 \Rightarrow x \leq \frac{1}{2}$$

$$-2 \leq x \leq -1 \vee \frac{1}{2} \leq x \leq 1 \vee x \geq 2$$

B

1. $2[4(x-1) - (x-4)] - 21[3x - (3-x) - (4x-5)] > 0$

$$2[4x - 4 - x + 4] - 21[3x - 3 + x - 4x + 5] > 0$$

$$6x - 21 \cdot 2 > 0 \quad x > 7$$

2. $2(2x+3) + \frac{1}{3}\left(2x + \frac{1}{2}\right) \geq \frac{37}{6}$

$$4x + 6 + \frac{2}{3}x + \frac{1}{6} \geq \frac{37}{6}$$

$$4x + \frac{2}{3}x \geq 6 - 6 \quad x \geq 0$$

3. $\frac{3x-4}{2-x} \geq -4$

$$\frac{3x-4+8-4x}{2-x} \geq 0$$

$$\frac{4-x}{2-x} \geq 0$$

$$N \geq 0: 4-x \geq 0 \Rightarrow x \leq 4$$

$$D > 0: 2-x > 0 \Rightarrow x < 2$$

$$x < 2 \vee x \geq 4$$

4. $x^2 - 3x - 54 > 0$

$$(x-9)(x+6) > 0$$

$$F_1 > 0: x-9 > 0 \Rightarrow x > 9$$

$$F_2 > 0: x+6 > 0 \Rightarrow x > -6$$

$$x < -6 \vee x > 9$$

5. $(x^2-9)(x^2-4)(5-10x) \leq 0$

$$(x+3)(x-3)(x+2)(x-2)(5-10x) \leq 0$$

$$F_1 \geq 0: x+3 \geq 0 \Rightarrow x \geq -3$$

$$F_2 \geq 0: x-3 \geq 0 \Rightarrow x \geq 3$$

$$F_3 \geq 0: x+2 \geq 0 \Rightarrow x \geq -2$$

$$F_4 \geq 0: x-2 \geq 0 \Rightarrow x \geq 2$$

$$F_5 \geq 0: 5-10x \geq 0 \Rightarrow x \leq \frac{1}{2}$$

$$-3 \leq x \leq -2 \vee \frac{1}{2} \leq x \leq 2 \vee x \geq 3$$