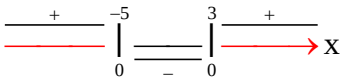
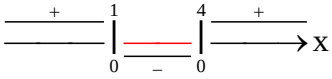
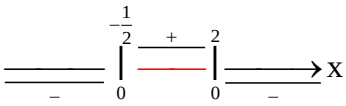
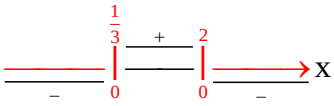
LES INEQUATIONS DU SECOND DEGRE

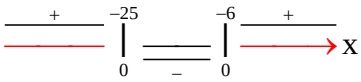
1. RESOUDRE LES INEQUATIONS SUIVANTES :

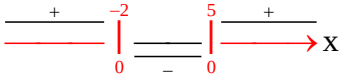
1. $x^2+2x-15>0$  $S=\{x|x<-5\}\cup\{x|x>3\}$

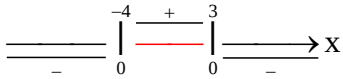
2. $x^2-5x+4<0$  $S=\{x|1<x<4\}$

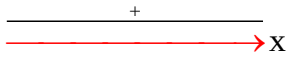
3. $-2x^2+3x+2>0$  $S=\left\{x|-\frac{1}{2}<x<2\right\}$

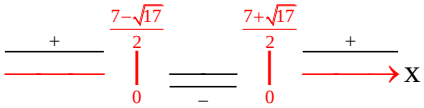
4. $-3x^2+7x-2\le 0$  $S=\left\{x|x\le\frac{1}{3}\right\}\cup\{x|x\ge 2\}$

5. $x^2+31x+150>0$  $S=\{x|x<-25\}\cup\{x|x>-6\}$

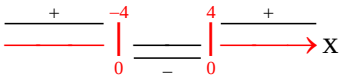
6. $x^2-10\ge 3x$ $x^2-3x-10\ge 0$  $S=\{x|x\le -2\}\cup\{x|x\ge 5\}$

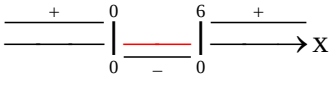
7. $-x^2-7>x-19$ $-x^2-x+12>0$  $S=\{x|-4<x<3\}$

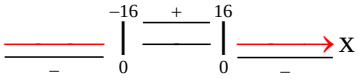
8. $x^2+7>3x$ $x^2-3x+7>0$  $S=\mathbb{R}$

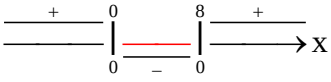
9. $x^2\ge 7x-8$ $x^2-7x+8\ge 0$ 

$$S=\left\{x|x\le\frac{7-\sqrt{17}}{2}\right\}\cup\left\{x|x\ge\frac{7+\sqrt{17}}{2}\right\}$$

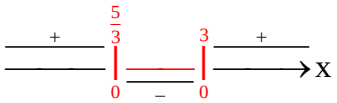
10. $x^2\ge 16$ $x^2-16\ge 0$  $S=\{x|x\le -4\}\cup\{x|x\ge 4\}$

11. $x^2<6x$ $x^2-6x<0$  $S=\{x|0<x<6\}$

12. $256<x^2$ $-x^2+256<0$  $S=\{x|x<-16\}\cup\{x|x>16\}$

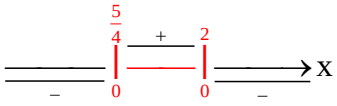
13. $x(x-2)<6x$ $x^2-8x<0$  $S=\{x|0<x<8\}$

14. $3x(x-3) \le 5(x-3)$ $\quad 3x^2 - 14x + 15 \le 0$



$S = \left\{ x \middle| \frac{5}{3} \le x \le 3 \right\}$

15. $(2-x)(4x-5) \ge 0$ $\quad -4x^2 + 13x - 10 \ge 0$



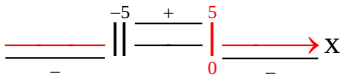
$S = \left\{ x \middle| \frac{5}{4} \le x \le 2 \right\}$

2. RESOUDRE LES INEQUATIONS RATIONNELLES SUIVANTES :

1. $\frac{x+2}{x-3} > 0$

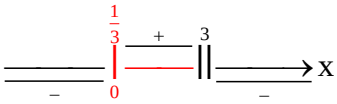
$S = \{ x \mid x < -2 \} \cup \{ x \mid x > 3 \}$

2. $\frac{-x+5}{5+x} \le 0$



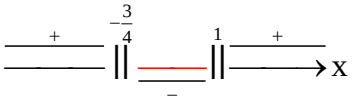
$S = \{ x \mid x < -5 \} \cup \{ x \mid x \ge 5 \}$

3. $\frac{3x-1}{3-x} \ge 0$



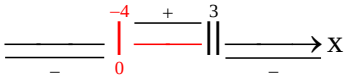
$S = \left\{ x \middle| \frac{1}{3} \le x < 3 \right\}$

4. $\frac{1}{4x^2 - x - 3} \le 0$



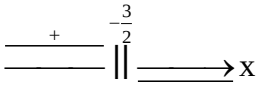
$S = \left\{ x \middle| -\frac{3}{4} < x < 1 \right\}$

5. $\frac{2x+1}{3-x} \ge -1$ $\quad \frac{x+4}{-x+3} \ge 0$



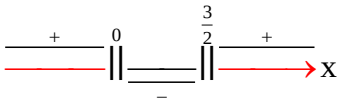
$S = \{ x \mid -4 \le x < 3 \}$

6. $\frac{x}{2x+3} \le \frac{1}{2}$ $\quad \frac{-3}{4x+6} \le 0$



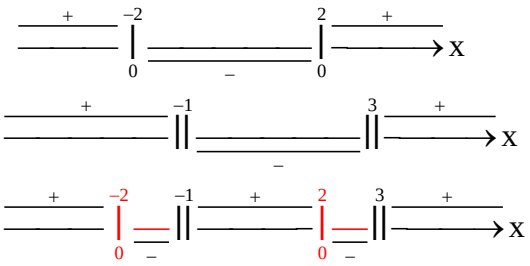
$S = \left\{ x \middle| x > -\frac{3}{2} \right\}$

7. $\frac{2}{2x-3} \ge \frac{1}{x}$ $\quad \frac{3}{x(2x-3)} \ge 0$



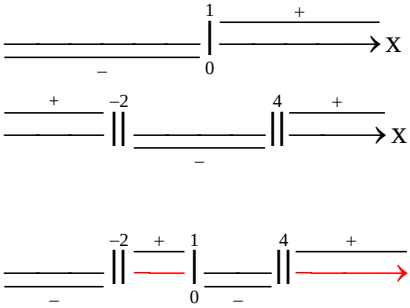
$S = \{ x \mid x < 0 \} \cup \left\{ x \middle| x > \frac{3}{2} \right\}$

8. $\dfrac{x^2-4}{x^2-2x-3} \le 0$ $\qquad \dfrac{(x+2)(x-2)}{(x-3)(x+1)} \le 0$



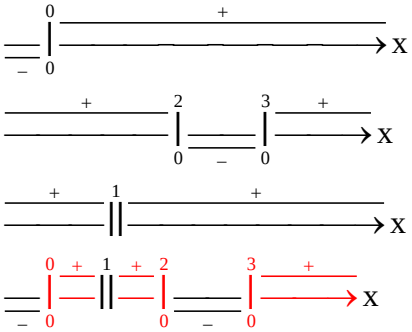
$S = \{x \mid -2 \le x < -1\}$
$\cup \{x \mid 2 \le x < 3\}$

9. $\dfrac{x-1}{x^2-2x-8} > 0$ $\qquad \dfrac{x-1}{(x-4)(x+2)} > 0$



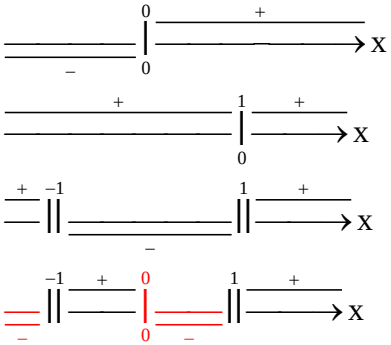
$S = \{x \mid -2 < x < 1\}$
$\cup \{x \mid x > 4\}$

10. $\dfrac{x(x-2)(x-3)}{(x-1)^2} \ge 0$



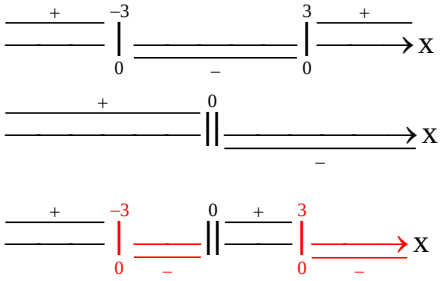
$S = \{x \mid 0 \le x < 1\} \cup \{x \mid 1 < x \le 2\}$
$\cup \{x \mid x \ge 3\}$

11. $\dfrac{x(x-1)^2}{(x-1)(x+1)} \le 0$



$S = \{x \mid x < -1\} \cup \{x \mid 0 \le x < 1\}$

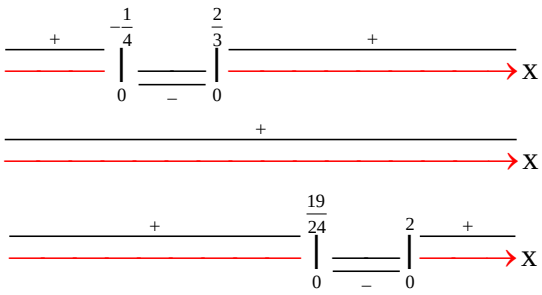
12. $\dfrac{(x^2+9)(x+3)(x-3)}{-x(x^2+x+1)} \le 0$



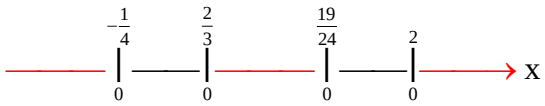
$S = \{x \mid -3 \le x < 0\} \cup \{x \mid x \ge 3\}$

3. RESOUDRE LES SYSTEMES SUIVANTS :

1. $\begin{cases} 12x^2 - 5x - 2 > 0 \\ 12x^2 + 5x + 38 > 0 \\ 24x^2 - 67x + 38 > 0 \end{cases}$

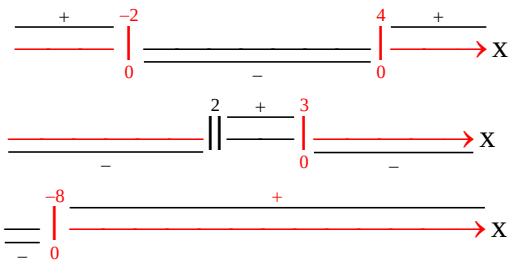


Solution

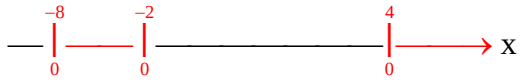


$S = \left\{x \mid x < -\frac{1}{4}\right\} \cup \left\{x \mid \frac{2}{3} < x < \frac{19}{24}\right\} \cup \{x \mid x > 2\}$

2. $\begin{cases} x^2 - 2x - 8 \ge 0 \\ -\dfrac{x-3}{2x-4} < 0 \\ x + 5 \ge -3 \end{cases}$

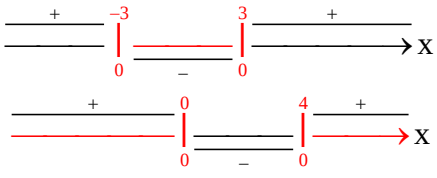


Solution

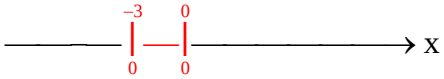


$S = \{x \mid -8 \le x \le -2\} \cup \{x \mid x \ge 4\}$

3. $\begin{cases} x^2 \le 9 \Leftrightarrow x^2 - 9 \le 0 \Leftrightarrow (x-3)(x+3) \le 0 \\ x^2 - 16 \ge 4(x-4) \Leftrightarrow x^2 - 4x \ge 0 \Leftrightarrow x(x-4) \ge 0 \end{cases}$

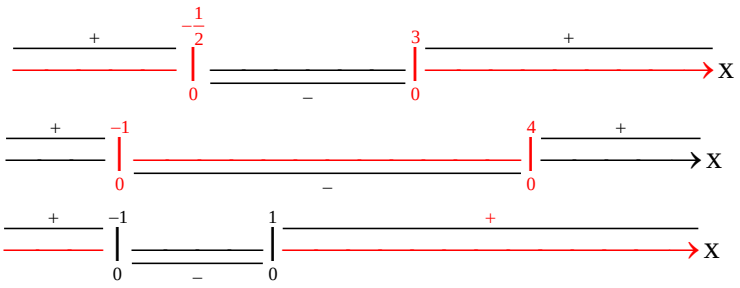


Solution

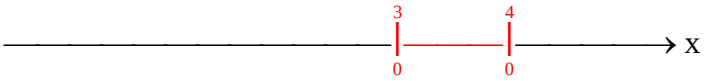


$S = \{x | -3 \le x \le 0\}$

4. $\begin{cases} 2x^2 - 5x - 3 \ge 0 \\ x^2 - 3x - 4 \le 0 \\ x^2 - 1 > 0 \end{cases}$

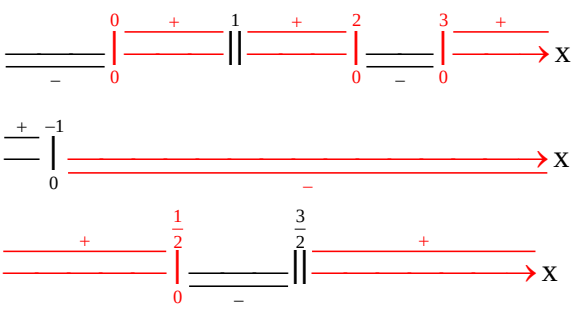


Solution

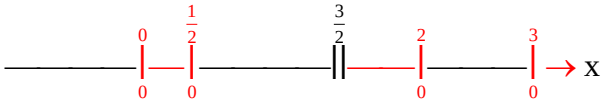


$S = \{x | 3 \le x \le 4\}$

5. $\begin{cases} \dfrac{x(x^2 - 5x + 6)}{(x-1)^2} \ge 0 \\ -x - 1 < 0 \\ \dfrac{2x-1}{2x-3} \ge 0 \end{cases}$

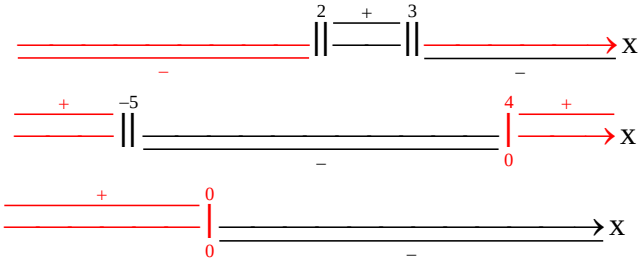


Solution

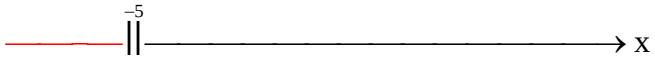


$S = \left\{x | 0 \le x \le \frac{1}{2}\right\} \cup \left\{x | \frac{3}{2} < x \le 2\right\} \cup \{x | x \ge 3\}$

6.
$$\begin{cases} \dfrac{-5}{x^2-5x+6} < 0 \\ -\dfrac{x-4}{-x-5} \geq 0 \\ \dfrac{-8x}{x^2+9} \geq 0 \end{cases}$$

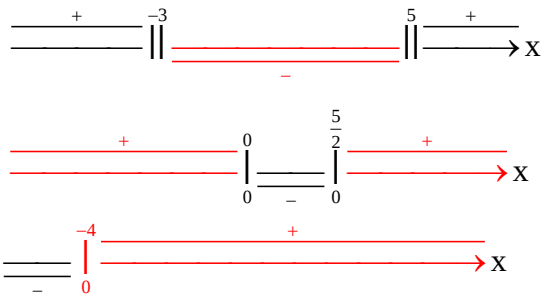


Solution

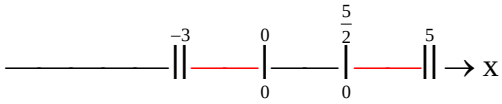


$S = \{x \mid x < -5\}$

7.
$$\begin{cases} \dfrac{6x^2+14x+20}{(x-5)(2x+6)} < 0 \\ x(2x-5) > 0 \\ 5x+20 \geq 0 \end{cases}$$



Solution



$S = \{x \mid -3 < x < 0\} \cup \left\{x \mid \dfrac{5}{2} < x < 5\right\}$