

**INEQUACIONS**

1.PRIMER GRAU

2.SEGON GRAU

3.RACIONALS

**1.PRIMER GRAU**

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Resoleu:

a) $\frac{4-3x}{2} < x+3$	Sol. $x > -2/5$
b) $2x-3 < 5$	Sol. $x < 4$
c) $2-x > 1$	Sol. $x < 1$
d) $-2x+8 < x-1$	Sol. $x > 3$
e) $\frac{x-5}{2} > x+3$	Sol. $x < -11$
<b>RAONAMENT</b>	
$\frac{x-5}{2} > x+3$ $x-5 > 2x+6$ $x-2x > 6+5$ $-x > 11$ $x < -11$	
f) $\frac{x}{2} + \frac{x}{3} > 3 - \frac{x}{6}$	Sol. $x > 3$
g) $\frac{2x-1}{3} + \frac{x+1}{3} < 2x-2$	Sol. $x > 2$



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h) $\frac{x}{3} + \frac{x+2}{5} > x - 1$	Sol. $x < 3$
i) $\frac{x-1}{3} - \frac{x-4}{2} < \frac{x+4}{2} - 3$	Sol. $x > 4$
j) $\frac{x+1}{3} - \frac{x-2}{5} > 1 + \frac{x-1}{15}$	Sol. $x > 3$

**RAONAMENT**

$\frac{x+1}{3} - \frac{x-2}{5} > 1 + \frac{x-1}{15}$	$5x + 5 - 3x + 6 > 15 + x - 1$
$5x - 3x - x > 15 - 1 - 5 - 6$	$x > 3$

k) $\frac{x-2}{5} - \frac{3x+1}{2} < \frac{x}{2} - 3x$	Sol. $x < 3/4$
l) $\frac{x}{3} - \frac{2x+5}{2} - \frac{3-2x}{6} > 0$	Sol. $x < -9$
m) $\frac{x-1}{3} - x < \frac{3-x}{4} - 1$	Sol. $x > -1/5$
n) $\frac{x}{3} + \frac{x+4}{7} - x + 1 < 0$	Sol. $x > 3$
o) $3x - \frac{1-2x}{4} < \frac{x-1}{2} + 1$	Sol. $x < 1/4$

**RAONAMENT**

$3x - \frac{1-2x}{4} < \frac{x-1}{2} + 1$	$12x - 1 + 2x < 2x - 2 + 4$
$12x < -2 + 4 + 1$	$12x < 3$ $x < 1/4$

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p) $\frac{2x+5}{6} > 1 + \frac{x+2}{3}$	Sol. cap solució
q) $\frac{x-1}{3} - \frac{2-x}{4} > \frac{2x-3}{2} - 1$	Sol. $x < 4$
r) $\frac{x+2}{2} < 3x$	Sol. $x > 2/5$
s) $\frac{x-1}{4} + 1 < \frac{x+3}{2}$	Sol. $x > -3$
t) $-3x + 7 < 2x - 3$	Sol. $x > 2$
u) $\frac{x-1}{3} > x+5$	Sol. $x < -8$

**RAONAMENT**

$$\boxed{\frac{x-1}{3} > x+5} \quad x-1 > 3x+15 \quad -2x > 16 \quad -x > 8$$

$$x < -8$$

**2.SEGON GRAU**

<i>Resoleu:</i>	
a) $x^2 - 2x - 3 > 0$	Sol. $(-\infty, -1) \cup (3, +\infty)$
b) $x^2 - x + 2 > x + 5$	Sol. $(-\infty, -1) \cup (3, +\infty)$
c) $x^2 - x + 5 < 2x + 5$	Sol. $(0, 3)$
d) $x^2 - x - 6 > 0$	Sol.



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	$(-\infty, -2) \cup (3, +\infty)$
e) $x^2 + 6x + 24 > 0$	Sol. $(-\infty, +\infty)$
<b>RAONAMENT</b>	
$x^2 + 6x + 24 > 0$	$x^2 + 6x + 24 = 0 \rightarrow x = \text{cap solució}$
$\rightarrow$ tots els reals	$x \in (-\infty, +\infty)$
f) $x^2 - 6x + 8 > 0$	Sol. $(-\infty, 2) \cup (4, +\infty)$
g) $x^2 + 2x - 8 \geq 0$	Sol. $(-\infty, -4] \cup (2, +\infty)$
h) $x^2 - 3x > 0$	Sol. $(-\infty, 0) \cup (3, +\infty)$
i) $x^2 - 1 \geq 0$	Sol. $(-\infty, -1] \cup [1, +\infty)$
j) $x^2 - 9x + 18 < 0$	Sol. $(3, 6)$
<b>RAONAMENT</b>	
$x^2 - 9x + 18 < 0$	$x^2 - 9x + 18 = 0 \rightarrow$
$\rightarrow \begin{cases} x = 3 \\ x = 6 \end{cases} \rightarrow$	$\begin{cases} (-\infty, 3) & \text{no} \\ 3 & \text{no} \\ (3, 6) & \text{si} \\ 6 & \text{no} \\ (6, \infty) & \text{no} \end{cases} \rightarrow$
$x \in (3, 6)$	
k) $x^2 - 7x + 12 < 0$	Sol. $(3, 4)$
l) $x^2 - x + 5 < 0$	Sol.



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	<i>Cap solució</i>
m) $2x^2 - 10x - 12 \leq 0$	Sol. [-1,6]
n) $x^2 + x - 6 < 0$	Sol. (-3,2)
o) $-3x^2 + 6x + 9 \leq 0$	Sol. $(-\infty, -1] \cup [3, +\infty)$
<b>RAONAMENT</b>	
$\boxed{-3x^2 + 6x + 9 \leq 0} \quad -3x^2 + 6x + 9 = 0 \quad \rightarrow \quad \begin{cases} x = -1 \\ x = 3 \end{cases}$	
$\rightarrow \begin{cases} (-\infty, -1) & \text{si} \\ -1 & \text{si} \\ (-1, 3) & \text{no} \\ 3 & \text{si} \\ (3, \infty) & \text{si} \end{cases} \rightarrow$	
$x \in (-\infty, -1] \cup [3, +\infty)$	
p) $x(x + 1) + 3x > 5x + 6$	Sol. $(-\infty, -2) \cup (3, +\infty)$
q) $(x - 1)^2 - (x + 3)^2 + x^2 \leq -9x - 8$	Sol. [-1,0]
r) $x(x^2 - 2) - (x + 1)(x^2 - 1) > -4 - x^2$	Sol. $(-\infty, 5)$
s) $(2x - 5)^2 \leq 1$	Sol. [2,3]
t) $2x(x + 2) + 6 \geq 0$	Sol. $(-\infty, +\infty)$
u) $-x(x + 1) + 2 \geq 0$	Sol. [-2,1]
<b>RAONAMENT</b>	



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$-x(x+1)+2 \geq 0$	$-x(x+1)+2 = 0$	$x^2 + x - 2 = 0$
$\rightarrow \begin{cases} x = -2 \\ x = 1 \end{cases}$	$\rightarrow \begin{cases} (-\infty, -2) & \text{no} \\ -2 & \text{si} \\ (-2, 1) & \text{si} \\ 1 & \text{si} \\ (1, +\infty) & \text{no} \end{cases}$	$\rightarrow$
$x \in [-2, 1]$		

**3.RACIONALS**

<div style="border: 1px solid gray; background-color: #ccc; padding: 5px; display: inline-block; margin-bottom: 5px;">1</div> <p><i>Resoleu:</i></p>	
a) $\frac{x-3}{x+1} > 0$	Sol. $(-\infty, -1) \cup (3, +\infty)$
b) $\frac{3-x}{x-2} \geq 0$	Sol. $(2, 3]$
c) $\frac{x}{2-x} \geq 0$	Sol. $[0, 2)$
d) $\frac{x+2}{x^2} < 0$	Sol. $x < -2$
e) $\frac{x-2}{x-1} > 0$	Sol. $(-\infty, 1) \cup (2, +\infty)$
<b>RAONAMENT</b>	



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$\frac{x-2}{x-1} > 0 \rightarrow \begin{cases} x-2=0 & x=2 \\ x-1=0 & x=1 \end{cases} \rightarrow$ $x \in (-\infty, 1) \cup (2, +\infty)$	$\begin{cases} (-\infty, 1) & \text{si} \\ 1 & \text{no} \\ (1, 2) & \text{no} \\ 2 & \text{no} \\ (2, \infty) & \text{si} \end{cases}$
<p>f) <math>\frac{2x-4}{x-1} &gt; 0</math></p>	<p>Sol. <math>(-\infty, 1) \cup (2, +\infty)</math></p>
<p>g) <math>\frac{x}{x+2} \geq 0</math></p>	<p>Sol. <math>(-\infty, -2) \cup [0, +\infty)</math></p>
<p>h) <math>\frac{x-3}{x+3} &gt; 0</math></p>	<p>Sol. <math>(-\infty, -3) \cup (3, +\infty)</math></p>
<p>i) <math>\frac{x+1}{x-2} - 2 \geq 0</math></p>	<p>Sol. <math>(2, 5]</math></p>
<p>j) <math>\frac{x+2}{x-1} &gt; 1</math></p>	<p>Sol. <math>(1, +\infty)</math></p>
<p><b>RAONAMENT</b></p>	
$\frac{x+2}{x-1} > 1 \rightarrow \frac{x+2}{x-1} - 1 > 0 \rightarrow \frac{3}{x-1} > 0 \rightarrow x-1 = 0$ $\rightarrow x=1 \rightarrow \begin{cases} (-\infty, 1) & \text{no} \\ 1 & \text{no} \\ (1, \infty) & \text{si} \end{cases}$ $x \in (1, +\infty)$	
<p>k) <math>\frac{(x+2)(x-2)}{x^2+3} &gt; 0</math></p>	<p>Sol. <math>(-\infty, -2) \cup (2, +\infty)</math></p>

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l) $\frac{(x+3)(2x-4)}{x^2+1} > 0$	Sol. $(-\infty, -3) \cup (2, +\infty)$
m) $\frac{x^2+1}{x^2-1} > 0$	Sol. $(-\infty, -1) \cup (1, +\infty)$
n) $\frac{-x^2+3x-2}{x^2+1} \geq 0$	Sol. $[1, 2]$
o) $\frac{x^2+4x+4}{x^2-x-6} \geq 0$	Sol. $(-\infty, -2) \cup (3, +\infty)$
<b>RAONAMENT</b>	
$\boxed{\frac{x^2+4x+4}{x^2-x-6} \geq 0} \rightarrow \begin{cases} x^2+4x+4=0 \\ x^2-x-6=0 \end{cases} \rightarrow \begin{cases} x=-2 \\ x=-2 \\ x=3 \end{cases}$	
$\rightarrow \begin{cases} (-\infty, -2) & \text{si} \\ -2 & \text{no} \\ (-2, 3) & \text{no} \\ 3 & \text{no} \\ (3, \infty) & \text{si} \end{cases} \rightarrow$	
$x \in (-\infty, -2) \cup (3, +\infty)$	
p) $\frac{x^2-1}{x^2-4x+4} > 0$	Sol. $(-\infty, -1] \cup [1, 2) \cup (2, +\infty)$
q) $\frac{x(x+2)}{x-2} > 0$	Sol. $(-2, 0) \cup (2, +\infty)$
r) $\frac{x^2-4}{x} \geq 0$	Sol. $[-2, 0) \cup [2, +\infty)$
s) $\frac{1-x^2}{x^2-4} > 0$	Sol. $(-2, -1) \cup (1, 2)$





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**RAONAMENT**

$$\boxed{\frac{1-x^2}{x^2-4} > 0} \rightarrow \begin{cases} x^2 - 1 = 0 \\ x^2 - 4 = 0 \end{cases} \rightarrow \begin{cases} x = \pm 1 \\ x = \pm 2 \end{cases} \rightarrow \begin{cases} (-\infty, -2) & \text{no} \\ -2 & \text{no} \\ (2, -1) & \text{si} \\ -1 & \text{no} \\ (-1, 1) & \text{no} \\ 1 & \text{no} \\ (1, 2) & \text{si} \\ 2 & \text{no} \\ (2, \infty) & \text{no} \end{cases}$$

$\rightarrow x \in (-2, -1) \cup (1, 2)$

$t) \frac{x^2 - x - 6}{x^2 - 3x + 6} > 0$	<i>Sol.</i> $(-\infty, -2) \cup (3, +\infty)$
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$u) \frac{x(x-2)}{(x+1)(x+3)} \geq 0$	<i>Sol.</i> $(-\infty, -3) \cup (-1, 0] \cup [2, +\infty)$
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$v) \frac{x+2}{x-1} \geq \frac{2x-1}{x+2} - 1$	<i>Sol.</i> $(-2, -1/8] \cup (1, +\infty)$
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$w) \frac{1}{x-1} > \frac{3}{x+1}$	<i>Sol.</i> $(-\infty, -1) \cup (1, 2)$
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**RAONAMENT**

$$\boxed{\frac{1}{x-1} > \frac{3}{x+1}} \Leftrightarrow \frac{1}{x-1} - \frac{3}{x+1} > 0 \Leftrightarrow$$

$$\frac{-2x+4}{(x-1)(x+1)} > 0$$

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$$\left\{ \begin{array}{l} -2x + 4 = 0 \\ x - 1 = 0 \\ x + 1 = 0 \end{array} \right. \quad \left\{ \begin{array}{l} x = -1 \\ x = 1 \\ x = 2 \end{array} \right. \quad \left\{ \begin{array}{ll} (-\infty, -1) & \text{si} \\ -1 & \text{no} \\ (-1, 1) & \text{no} \\ 1 & \text{no} \\ (1, 2) & \text{si} \\ 2 & \text{no} \\ (2, +\infty) & \text{no} \end{array} \right. \Rightarrow$$

$$x \in (-\infty, -1) \cup (1, 2)$$