

FICHA INECUACIONES

1) a) $3x + 3(2x-5) - 4(x-2) \leq 2-x \Rightarrow$

$\Rightarrow 3x + 6x - 15 - 4x + 8 + x - 2 \leq 0 \Rightarrow 6x \leq 9 \Rightarrow x \leq \frac{9}{6} = \frac{3}{2}$

Sol: $(-\infty, \frac{3}{2}]$

b) $\frac{x}{2} - \frac{x-1}{6} > 1 - \frac{2x-5}{2} \Rightarrow 3x - x + 1 > 6 - 6x + 15 \Rightarrow 8x > 20 \Rightarrow$

$\Rightarrow x > \frac{20}{8} = \frac{5}{2}$ Sol: $(\frac{5}{2}, \infty)$

c) $\frac{x+1}{3} - \frac{x+2}{4} + \frac{x-3}{18} \geq -\frac{8}{9} \Rightarrow 12(x+1) - 9(x+2) + 2(x-3) \geq -32 \Rightarrow$

$\Rightarrow 12x + 12 - 9x - 18 + 2x - 6 \geq -32 \Rightarrow 5x \geq -20 \Rightarrow x \geq -4$

Sol: $[-4, \infty)$

d) $\frac{2x-3}{4} - \frac{x}{2} \leq 2(x-1) - \frac{25}{4} \Rightarrow 2x - 3 - 2x \leq 8x - 8 - 35 \Rightarrow$

$\Rightarrow -8x \leq -40 \Rightarrow x \geq 5$ Sol: $[5, \infty)$

2) a) $x^2 + x - 12 \geq 0$

$x = \frac{-1 \pm \sqrt{1+48}}{2} = \frac{-1 \pm 7}{2} < -4$

$+ \frac{-4}{-} \frac{3}{+}$

Sol: $(-\infty, -4] \cup [3, \infty)$

b) $-2x^2 + 3x > 0 \Rightarrow 2x^2 - 3x < 0$

$x(2x-3) = 0 \Rightarrow x=0, x=\frac{3}{2}$

$+ \frac{0}{-} \frac{3/2}{+}$

Sol: $(0, 3/2)$

c) $4x^2 - 1 \leq 0$

$4x^2 - 1 = 0 \Rightarrow x = \pm 1/2$

$+ \frac{-1/2}{-} \frac{1/2}{+}$

Sol: $[-1/2, 1/2]$

d) $6x^2 + x - 1 < 0$

$x = \frac{-1 \pm \sqrt{1+24}}{12} = \frac{-1 \pm 5}{12} < \frac{4}{12} = \frac{1}{3}$

$+ \frac{-1/2}{-} \frac{1/3}{+}$

Sol: $(-\frac{1}{2}, \frac{1}{3})$

e) $x^3 - 4x \leq 0$

$x^3 - 4x = 0 \Rightarrow x(x^2 - 4) = 0 \Rightarrow x = 0$
 $x = \pm 2$

$-2 + \frac{0}{-} \frac{2}{+}$

Sol: $(-\infty, -2] \cup [0, 2]$

f) $x^3 - 3x - 2 < 0$

$x^3 - 3x - 2 = 0$

$-1 \mid 1 \ 0 \ -3 \ -2$
 $-1 \ -1 \ 1 \ 1 \ -2$
 $\hline 1 \ -1 \ -2 \ 2$

$-1 \ 2 \ +$

$x^2 - x - 2 = 0$

$x = \frac{1 \pm 3}{2} < -1$

Sol: $(-\infty, -1) \cup (-1, 2)$

g) $x^2 - 1 \geq 0$

$x = \pm 1$

$+ \frac{-1}{-} \frac{1}{+}$

Sol: $(-\infty, -1] \cup [1, \infty)$

h) $x^3 - 7x + 6 \leq 0$

$x^3 - 7x + 6 = 0$

$1 \mid 1 \ 0 \ -7 \ 6$
 $1 \ 1 \ 1 \ 1 \ -6$
 $\hline 1 \ 1 \ 1 \ -6 \ 0$

$x^2 + x - 6 = 0$

$x = \frac{-1 \pm 5}{2} < -3$

$-3 \ 1 \ 2 \ +$

Sol: $(-\infty, -3] \cup [1, 2]$

6) a) $2x + 3(x-1) < 7$

$3x + 2 \leq x + 6$

Sol: $(-\infty, 2)$

b) $(x-3)^2 + 1 \geq 0$

$x^2 - 11x + 28 < 0$

$x^2 - 6x + 10 = 0$

$x = \frac{6 \pm \sqrt{36 - 40}}{2}$

$x^2 - 11x + 28 = 0$

$x = \frac{11 \pm \sqrt{121 - 112}}{2} = \frac{11 \pm 3}{2} < 7$

$x^2 - 6x + 10$ siempre es positivo

Sol: $(-\infty, 4) \cup (7, \infty)$

c) $-3(x-3) - 2x \leq -3$

$2x - 3 < x + 3$
 $x \leq 5$
 $x \geq 0$

$-3x + 9 - 2x \leq -3 \Rightarrow -5x \leq -12 \Rightarrow x \geq \frac{12}{5}$

$0 \ 12/5 \ 5 \ 6$

Sol: $[\frac{12}{5}, 5]$