**departamento de matemática** **universidade de aveiro**

1. Indique o conjunto solução das seguintes inequações.

(a) $8(1-x) \leq 4(3x-5)$

(b) $3x-(2x+1) > 5(1-x)$

(c) $2(x-1) < 2(x+4)$

(d) $1-(2x+5) \geq 7-(8-5x)$

(e) $5(x-5) < 3(1-2x)$

(f) $\frac{x}{3} \leq 7(x+5)$

(g) $-(1+3x) \leq -\frac{5}{2}$

(h) $\frac{5x-3}{2} > 7x$

(i) $\frac{1-(2x-1)}{2} \leq 0$

(j) $1-5x \geq 2-\frac{x+1}{3}$

(k) $\frac{1-\frac{x}{2}}{3} < 2$

(l) $x-\frac{4x-1}{2} < 1$

(m) $\frac{x+10}{4} > 5-x$

(n) $3\left(\frac{x}{2}+1\right) \leq x-2(1-x)$

(o) $4-\frac{10x+1}{6} < 4x-\frac{16x+3}{4}$

(p) $\frac{2(x+1)}{3}-\frac{x+2}{4} > 2x$

(q) $4x^2-3x \geq 0$

(r) $-x^2+12x-27 \geq 0$

(s) $4x^2+x+7 > 0$

(t) $x^2-10x+25 \leq 0$

(u) $x \leq x^2$

(v) $x^2-x < 2x-3$

(w) $\left(x-\frac{1}{2}\right)(3-x) < 0$

(x) $\frac{1}{2}(7-3x)(5-x) \geq 0$

(y) $(x-4)^2-3(x-2)^2 > 0$

(z) $\frac{x^2-4}{12}+\frac{x^2+4}{8} > 1$

(aa) $x^4-6x^2+x^3 \geq x+x^2-6$

(ab) $2x^3+6x^2 < x^2+4x+3$

(ac) $7x^2+29x-30 < 2x(x^2+2x)$

(ad) $2x^2+3x+2 \leq x^4$

(ae) $\frac{x-3}{4-x} \leq 1$

(af) $\frac{1}{x-2}-\frac{3}{x+1} \geq 0$

(ag) $\dfrac{x(x-1)}{x(x+2)} \geq -3$

(ah) $\dfrac{x-1}{x+4} \leq \dfrac{x-5}{x-1}$

(ai) $\dfrac{x+2}{x+8} > \dfrac{x-2}{x+3}$

(aj) $\dfrac{x+3}{3} - \dfrac{4}{x+2} < \dfrac{x}{3}$

(ak) $\dfrac{4x+3}{2x-5} - \dfrac{3x+8}{3x-7} \geq 1$

(al) $\dfrac{1}{x-2} + \dfrac{x}{3x+6} < \dfrac{4}{x^2-4}$

(am) $\dfrac{x}{x+12} \geq \dfrac{x+1}{20}$

(an) $\dfrac{x^2+1}{x^2} \leq 0$

(ao) $\dfrac{x^2-2x}{x^2+1} < 0$

(ap) $\dfrac{-x^2+4x+5}{x^2+2x+6} \geq 0$

(aq) $\dfrac{x^2+6x-45}{x^2-9} > 5$

(ar) $\dfrac{x-5}{x+8} \leq \dfrac{x-1}{x-2}$

(as) $\dfrac{-x^3+3x^2+x-3}{x+2} \leq 0$

(at) $\dfrac{2x^3+7x^2+2x-3}{x^3-6x^2+3x+10} < 0$

2. Indique o conjunto solução das seguintes inequações com módulos:

(a) $|x-3| < 6$

(b) $|2x-5| > 1$

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

(d) $|x-4| \geq 3x-6$

(e) $|2x-6| < x+4$

(f) $|x^2-5x| < 3x-6$

(g) $2x^2 - 2|x| > 8$

(h) $(x-6)^2 - 4|x-6| - 5 \leq 0$

(i) $\left|\dfrac{x+3}{x-5}\right| > 1$

(j) $\left|\dfrac{x-1}{2-x}\right| \leq 3$

(k) $\left|\dfrac{1-x}{x+1}\right| \leq x$

(l) $\left|\dfrac{x^2+2}{x+3}\right| > x-1$

1. (a) $\left[\frac{7}{5},+\infty\right[$; (b) $]1,+\infty[$; (c) $\mathbb{R}$; (d) $]-\infty,-\frac{3}{7}[$; (e) $]-\infty,\frac{28}{11}[$; (f) $\left[-\frac{21}{4},+\infty\right[$;
(g) $\left[\frac{1}{2},+\infty\right[$; (h) $]-\infty,-\frac{1}{3}[$; (i) $[1,+\infty[$; (j) $]-\infty,-\frac{1}{7}]$; (k) $]-10,+\infty[$;
(l) $]-\frac{1}{2},+\infty\left[$; (m) $]2,+\infty[$; (n) $\left[\frac{10}{3},+\infty\right[$; (o) $]\frac{11}{4},+\infty\left[$; (p) $]-\infty,\frac{2}{19}[$;
(q) $]-\infty,0]\cup\left[\frac{3}{4},+\infty\right[$; (r) $[3,9]$; (s) $\mathbb{R}$; (t) $\{5\}$; (u) $]-\infty,0]\cup[1,+\infty[$;
(v) $\emptyset$; (w) $]-\infty,\frac{1}{2}[\cup]3,+\infty[$; (x) $]-\infty,\frac{7}{3}]\cup[5,+\infty[$; (y) $\left]1-\frac{\sqrt{48}}{4},1+\frac{\sqrt{48}}{4}\right[$;
(z) $]-\infty,-2[\cup]2,+\infty[$; (aa) $]-\infty,-3]\cup[-1,1]\cup[2,+\infty[$; (ab) $]-\infty,-3[\cup\left]-\frac{1}{2},1\right[$;
(ac) $\left]\frac{-1+\sqrt{241}}{-4},1\right[\cup\left]\frac{-1-\sqrt{241}}{-4},+\infty\right[$; (ad) $]-\infty,-1]\cup[2,+\infty[$; (ae) $]-\infty,\frac{7}{2}]\cup]4,+\infty[$;
(af) $]-\infty,-1[\cup]2,\frac{7}{2}]$; (ag) $]-\infty,-2[\cup\left[-\frac{5}{4},+\infty\right[\setminus\{0\}$; (ah) $]-4,1[\cup[21,+\infty[$;
(ai) $]-\infty,-8[\cup]-3,22[$; (aj) $]-2,2[$; (ak) $\left[\frac{16}{9},\frac{7}{3}\right[\cup\left]\frac{5}{2},+\infty\right[$; (al) $]-3,-2[$;
(am) $]-\infty,-12[\cup[3,4]$; (an) $\emptyset$; (ao) $]0,2[$; (ap) $[-1,5]$; (aq) $]-3,0[\cup\left]\frac{3}{2},3\right[$;
(ar) $\left]-8,\frac{9}{7}\right]\cup]2,+\infty[$; (as) $]-\infty,-2[\cup[-1,1]\cup[3,+\infty[$;
(at) $]-3,-1[\cup\left]-1,\frac{1}{2}\right[\cup]2,5[$.
2. (a) $]-3,9[$; (b) $]-\infty,2[\cup]3,+\infty[$; (c) $\left[\frac{1}{5},5\right]$; (d) $]-\infty,\frac{5}{2}]$; (e) $\left]\frac{2}{3},10\right[$;
(f) $\left]\frac{2+\sqrt{28}}{2},\frac{8+\sqrt{40}}{2}\right[$; (g) $\left]-\infty,\frac{-1-\sqrt{17}}{2}\right[\cup\left]\frac{1+\sqrt{17}}{2},+\infty\right[$; (h) $[1,11]$; (i) $]1,+\infty[\setminus\{5\}$
(j) $]-\infty,\frac{7}{4}]\cup\left[\frac{5}{2},+\infty\right[$; (k) $\left[-1+\frac{\sqrt{8}}{2},+\infty\right[$; (l) $]-\infty,\frac{5}{2}[$.