SOLUÇÃO DA PROVA

1. COMPLETAMENTO DE QUADRADO

$x^2+x-2=0 \Rightarrow x^2+x=2 \Rightarrow$

$\Rightarrow x^2+2\cdot x\cdot\frac{1}{2}+\left(\frac{1}{2}\right)^2-\left(\frac{1}{2}\right)^2=2 \Rightarrow$

$\Rightarrow x^2+2x\cdot\frac{1}{2}+\left(\frac{1}{2}\right)^2=2+\left(\frac{1}{2}\right)^2=2+\frac{1}{4} \Rightarrow$

$\Rightarrow \left(x+\frac{1}{2}\right)^2=\frac{8+1}{4}=\frac{9}{4} \Rightarrow$

$\Rightarrow \sqrt{\left(x+\frac{1}{2}\right)^2}=\pm\sqrt{\frac{9}{4}}=\pm\frac{3}{2} \Rightarrow$

$\left(x+\frac{1}{2}\right)=\pm\frac{3}{2} \Rightarrow x+\frac{1}{2}=\frac{3}{2}$ ou

$x+\frac{1}{2}=-\frac{3}{2} \Rightarrow \boxed{x=1 \text{ ou } x=-2}$

2. FÓRMULA DE BHASKARA

(a) $x^2-x-20=0$

SOLUÇÃO

$x=\frac{-(-1)\pm\sqrt{1^2-4(1)(-20)}}{2\cdot 1}=$

$=\frac{1\pm\sqrt{1+80}}{2}=\frac{1\pm\sqrt{81}}{2}=\frac{1\pm 9}{2}$

$\Rightarrow x=\frac{1+9}{2}=5$ ou $x=\frac{-8}{2}=-4$

$\therefore \boxed{x=5 \text{ ou } x=-4}$

(b) $4x^2-4x+1=0$

SOLUÇÃO

$x=\frac{-(-4)\pm\sqrt{(-4)^2-4(4)(1)}}{2\cdot 4}=$

$=\frac{4\pm\sqrt{16-16}}{8}=\frac{4\pm 0}{8}=\frac{1}{2}$

$\therefore \boxed{x=\frac{1}{2}}$

(3) (a) $|x+3|\geq 5 \Rightarrow x+3\geq 5$

ou $x+3\leq -5 \Rightarrow x\geq 2$ ou $x\leq -8$

$S=]-\infty,-8]\cup[2,+\infty[$

(b) $|2x-4|<2 \Rightarrow -2<2x-4<2$

$\Rightarrow -2+4<2x<2+4 \Rightarrow 2<2x<6$

$\Rightarrow \frac{2}{2}<x<\frac{6}{2} \Rightarrow 1<x<3$

$S=]1,3[$;

(4) $P=\frac{1200}{V}$, P: PRESSÃO, V: VOLUME

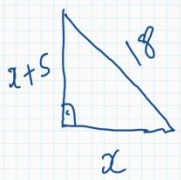
$30\leq V\leq 50$, COMO $p/V=37$

$P=\frac{120p}{3p}=40$ E $p/V=50$,

ASSIM,

$P=\frac{120p}{5p}=24$. $\boxed{24\leq P\leq 40}$

(5) RESOLVER O TRIÂNGULO



"$(x+5)^2+x^2=18^2$"

$(x+5)^2+x^2=18^2 \Rightarrow x^2+10x+25+x^2=18^2$

$\Rightarrow 2x^2+10x+25-324=0 \Rightarrow$

$2x^2+10x-299=0$ (USAMOS BHASKARA)

$x=\frac{-10\pm\sqrt{10^2-4(2)(-299)}}{2\cdot 2}=$

$=\frac{-10\pm\sqrt{100+2392}}{4}=\frac{-10\pm\sqrt{2492}}{4}$

$x=\frac{-10+\sqrt{2492}}{4}$, LOGO A ALTURA É $\frac{-10+\sqrt{2492}}{4}+5$

(6) (a) $3x-1\geq 4x-4 \Rightarrow$

$3x-4x\geq -4+1 \Rightarrow -x\geq -3 \Rightarrow$

$\boxed{x\leq 3}$;

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

$10-6x+6x-3\leq 2x+1 \Rightarrow$

$7\leq 2x+1 \Rightarrow 7-1\leq 2x \Rightarrow$

$6\leq 2x \Rightarrow \boxed{3\leq x}$

(c) $\frac{3-x}{2}+\frac{5x-2}{3}<-1 \Rightarrow$

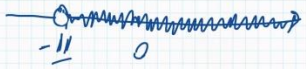
$6\left(\frac{3-x}{2}\right)+6\left(\frac{5x-2}{3}\right)<6\cdot(-1) \Rightarrow$

$\Rightarrow 3(3-x)+2(5x-2)<-6 \Rightarrow$

$\Rightarrow 9-3x+10x-4<-6 \Rightarrow$

$7x+5<-6 \Rightarrow 7x<-6-5 \Rightarrow$

$7x<-11 \Rightarrow x<\frac{-11}{7}$



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⑦ (a) $6x^2-5x-4>0$

Solução

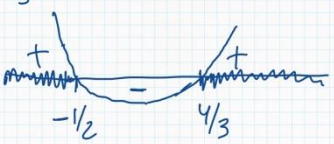
$6x^2-5x-4=0 \Rightarrow x=\frac{-(-5)\pm\sqrt{25+96}}{12}$

$\Rightarrow x=\frac{5\pm\sqrt{121}}{12}=\frac{5\pm 11}{12}$

$x=\frac{5+11}{12}=\frac{16}{12}=\frac{4}{3}$ ou $x=\frac{5-11}{12}=\frac{-6}{12}$

$x=-\frac{1}{2}$

$x=\frac{4}{3}$ ou $x=-\frac{1}{2}$



$S=]-\infty,-\frac{1}{2}[\cup]\frac{4}{3},+\infty[$

(b) $-3x^2+9x<6x \Rightarrow$

$-3x^2+9x-6x<0 \Rightarrow -3x^2+3x<0$

$\Rightarrow -3x(x-1)<0 \Rightarrow$ "$-3x<0$ E $x-1>0$" ou "$-3x>0$ E $x-1<0$" $\Rightarrow$

$\Rightarrow$ "$x>0$ E $x>1$" ou "$x<0$ E $x<1$"

$\Rightarrow x>1$ ou $x<0$

$S=]-\infty,0[\cup]1,+\infty[$

(c) $-x^2-3x-2>0$

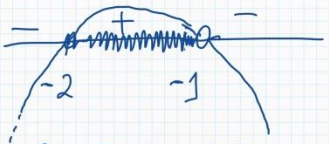
Solução

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

$x=\frac{-(-3)\pm\sqrt{9-4(-1)(-2)}}{2(-1)}=$

$=\frac{3\pm\sqrt{1}}{-2}=\frac{3\pm 1}{-2}$

$x=\frac{3+1}{-2}=-2$ ou $x=\frac{3-1}{-2}=-1$



$S=]-2,-1[$

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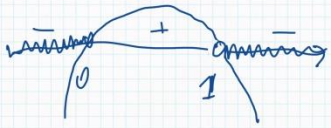
$x=\frac{4}{3}$ ou $x=-\frac{1}{2}$

⑦ (b) PODE-SE FAZER TAMBÉM USANDO FÓRMULA DE BHASKARA.

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

$x=\frac{-3\pm\sqrt{9-4(-3)(0)}}{2(-3)}=\frac{-3\pm 3}{-6}$

$x=\frac{-6}{-6}=1$ ou $x=\frac{0}{-6}=0$



$S=]-\infty,0[\cup]1,+\infty[$