Name: Key

Absolute Value and Polynomial Inequalities

Solve each inequality. Put the solution in interval notation.

1. $|2x-5|\le 7$

$-7\le 2x-5\le 7$

$-2\le 2x\le 12$

$\boxed{-1\le x\le 6}$ $x\in[-1,+6]$

2. $|2-3x|\ge 13$

$2-3x\ge 13$ $2-3x\le -13$

$-3x\ge 11$ $-3x\le -15$

$\boxed{(-\infty,-11/3]\cup[5,\infty)}$ $x\le -11/3$ $x\ge 5$

3. $x^2-4x>5$

$x^2-4x-5=0$

$(x-5)(x+1)=0$

$x=5,-1$

$(-\infty,-1)(-1,5)(5,\infty)$

$+ \quad - \quad +$

$\boxed{(-\infty,-1)(5,\infty)}$

4. $3x^3-9x^2-x<-3$

$3x^3-9x^2-x+3=0$

$3x^2(x-3)-1(x-3)=0$

$(3x^2-1)(x-3)=0$ $x=\pm\sqrt{\frac{1}{3}}=\pm.577$

$\boxed{\begin{matrix} - & \\ (-\infty,-.577) & \\ - & \\ (.577,3) & \end{matrix}}$ $\begin{matrix} + \\ (-.577,.577) \\ + \\ (3,\infty) \end{matrix}$

5. $x^4-34x^2+225\le 0$

$(x^2-25)(x^2-9)=0$

$\frac{+34\pm\sqrt{16}}{2}$

$x=\pm 5, \pm 3$

$(-\infty,-5)(-5,-3)(-3,3)(3,5)(5,\infty)$ $[-5,-3]\,[3,5]$

$+ \quad - \quad + \quad - \quad +$

6. $x^2+2x>-4$

$x^2+2x+4=0$

$x^2+2x+4>0$ $\mathbb{R}$

7. $x^2+2x+1\leq 0$

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

$x=-1$

8. $2x^2+3x+8<0$

$(2x \quad)(x \quad)$ $\emptyset$

$9-4(2)(8)$

9. $x^2-6x+9>0$

$(x-3)^2$ $(-\infty,3)(3,\infty)$

10. Quality control has an acceptable weight differential of ½ oz. If a machine part is supposed to weigh 4.8 oz., determine the interval containing the acceptable weight ranges. Write as an absolute value inequality.

$|x-4.8|\leq .5$