Absolute Value Equations

Directions: Solve each equation.

1. $|x| = 4$

$x=4$ $\quad$ $x=-4$

2. $|v+2| = 6$

$v+2=6$ $\quad$ $v+2=-6$

$-2 \quad -2$ $\quad$ $-2 \quad -2$

$v=4$ $\quad$ $v=-8$

3. $|x|-10 = -5$

$+10 \quad +10$

$|x| = 5$

$x=5$ $\quad$ $x=-5$

4. $-3|x|=6$

$\frac{-3|x|}{-3}=\frac{6}{-3}$

$|x|=-2$

No solution

5. $|m-2|=0$

$m-2=0$

$+2 \quad +2$

$m=2$

6. $-2|v-7|=-20$

$\frac{-2|v-7|}{-2}=\frac{-20}{-2}$

$|v-7|=10$

$v-7=10$ or $v-7=-10$

$+7 \quad +7$ $\quad$ $+7 \quad +7$

$v=17$ $\quad$ $v=-3$

7. $-3|5x-12|+6=3$

$-6 \quad -6$

$\frac{-3|5x-12|}{-3} = \frac{-3}{-3}$

$|5x-12| = 1$

$5x-12=1$ $\quad +12 \quad +12$

$\frac{5x}{5} = \frac{13}{5}$

$x = 13/5$

$5x-12=-1$ $\quad +12 \quad +12$

$\frac{5x}{5} = \frac{11}{5}$

$x = 11/5$

8. $4-3|k+2|=-14$

$-4 \quad -4$

$\frac{-3|k+2|}{-3} = \frac{-18}{-3}$

$|k+2| = 6$

$k+2=6$ $\quad -2 \quad -2$

$k=4$

$k+2=-6$ $\quad -2 \quad -2$

$k=-8$

9. $\left|\frac{4}{3}-x\right|=\frac{2}{5}$

$5\cdot\frac{4}{3}-\frac{x}{1}\cdot\frac{15}{15}=\frac{2}{5}\cdot 3$

LCD = 15

3: 3, 6, 9, 12, 15

5: 5, 10, 15, 20, 25

$\frac{20}{15}-\frac{15x}{15}=\frac{6}{15}$

$20-15x=6$

$-20\quad -20$

$-15x=-14$

$\frac{-15x}{-15}=\frac{-14}{-15}$

$x=14/15$

$5\cdot\frac{4}{3}-\frac{x}{1}\cdot\frac{15}{15}=-\frac{2}{5}\cdot 3$

LCD = 15

$\frac{20}{15}-\frac{15x}{15}=\frac{-6}{15}$

$20-15x=-6$

$-20\quad -20$

$\frac{-15x}{-15}=\frac{-26}{-15}$

$x=26/15$

10. $-\frac{1}{3}|x-4|+6=4$

$-6\quad -6$

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

$|x-4|=6$

$x-4=6$ $\quad$ $x-4=-6$

$+4\quad +4$ $\quad$ $+4\quad +4$

$x=10$ $\quad$ $x=-2$