ABSOLUTE VALUE EQUATIONS

IF

$|P| = Q$

THEN

$P = Q \quad P = -Q$

#1

$|\underbrace{X-7}_{P}| = \underbrace{4}_{Q}$

$P = Q \qquad P = -Q$

$X-7 = 4 \qquad X-7 = -4$

$X = 4+7 \qquad X = -4+7$

$X = 11 \qquad X = 3$

#2

$|5y+2| - 6 = -2$

$|5y+2| = -2+6$

$|5y+2| = 4$

$5y+2 = 4 \qquad 5y+2 = -4$

$5y = 4-2 \qquad 5y = -4-2$

$5y = 2 \qquad 5y = -6$

$\frac{5y}{5} = \frac{2}{5} \qquad \frac{5y}{5} = \frac{-6}{5}$

$y = \frac{2}{5} \qquad y = \frac{-6}{5}$

#3

$\left|\frac{3x-1}{4}\right| = 5$

$\frac{3x-1}{4} = 5 \qquad \frac{3x-1}{4} = -5$

$4\left(\frac{3x-1}{4}\right) = 4(5) \qquad 4\left(\frac{3x-1}{4}\right) = 4(-5)$

$3x-1 = 20 \qquad 3x-1 = -20$

$3x = 20+1 \qquad 3x = -20+1$

$3x = 21 \qquad 3x = -19$

$\frac{3x}{3} = \frac{21}{3} \qquad \frac{3x}{3} = \frac{-19}{3}$

$x = 7 \qquad x = -\frac{19}{3}$

#4

$|7x-1| = |3x+3|$

PRETEND IT LOOKS LIKE

$|7x-1| = 3x+3$

$7x-1 = 3x+3 \qquad 7x-1 = -(3x+3)$

$7x-3x = 3+1 \qquad 7x-1 = -3x-3$

$4x = 4 \qquad 7x+3x = -3+1$

$\frac{4x}{4} = \frac{4}{4} \qquad 10x = -2$

$x = 1 \qquad \frac{10x}{10} = \frac{-2}{10}$

$x = -\frac{1}{5}$

#5

$|5x+1| = -2$

NO SOL.

#6

$-4|x+3| = -16$

$\frac{-4|x+3|}{-4} = \frac{-16}{-4}$

$|x+3| = 4$

$x+3 = 4 \qquad x+3 = -4$

$x = 4-3 \qquad x = -4-3$

$x = 1 \qquad x = -7$

#7

$|x+7| = 0$

$x+7 = 0$

$x = -7$