

8/26/16

Find the numbers x

with $|x-1|=3$

or $|2+1| \stackrel{!}{=} 3 \checkmark$

$| -4+1 | = | -3 |$
 $= 3 \checkmark$

Recall $|x| = x$ or $-x$. Try

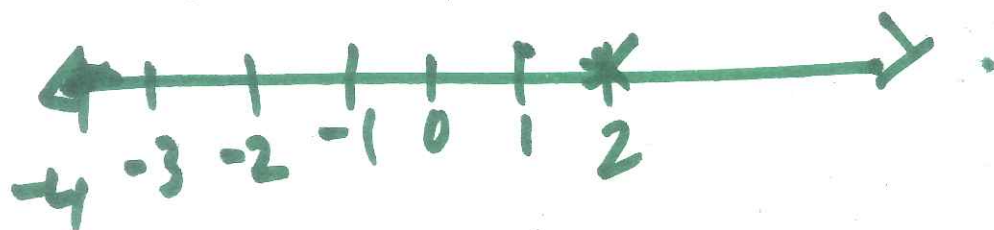
$x+1=3$ or $-(x+1)=3$

$x=2$ or $-x-1=3$

$-x=4$

$x=-4$.

Check



Solve

$$|x+3| \leq 5.$$

~~$$-5 \leq x+3 \leq 5$$~~

$$-5 \leq x+3 \leq 5$$

$$-8 \leq x \leq 2$$

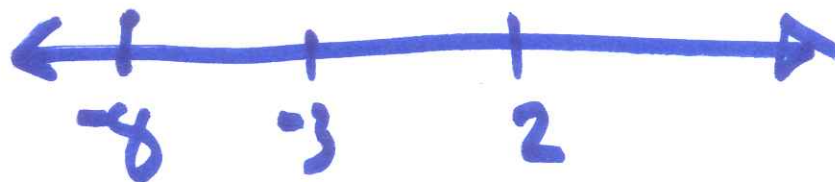
Solution is
 x in $[-8, 2]$

Check $x=0$

$$|0+3| = 3. \text{ Is } 3 \leq 5?$$

Yes 😊

-OR-



$|x+3|$ means

$|x - (-3)|$ the dist.
from -3 to x .

$[-8, 2]$ is all
numbers that

are 5 units or

less from -3 .

Solve

$$|x| = 1 - 2x$$

$$x = 1 - 2x \quad \text{or}$$

$$-x = (1 - 2x)$$

$$x = 1 - 2x$$

$$-x = 1 - 2x$$

$$3x = 1$$

$$2x - x = 1$$

$$x = \frac{1}{3}$$

$$x = 1$$

Check:

$$|\frac{1}{3}| = ? \quad 1 - 2\frac{1}{3} = \frac{1}{3} \quad \checkmark$$

$$|1| = ? \quad 1 - 2 = -1 \quad \text{3}$$



Answer is $\frac{1}{3}$.

Quadratic equations) Factoring ⁴

$$ax^2 + bx + c = 0$$

$$a \neq 0$$

3 methods

- Factoring
- Completing the square
- Quadratic formula.

Know if $a \cdot b = 0$, then
 $a = 0$ or $b = 0$.

Solve

$$x^2 + 3x = 4.$$

-4 -4

$$x^2 + 3x - 4 = 0$$

$$(x + 4)(x - 1)$$

$$= x(x - 1) + 4(x - 1)$$

$$= x^2 - x + 4x - 4$$

$$(x+4)(x-1) = 0$$

So

$$x+4=0 \text{ or}$$

$$x-1=0$$

$$x=-4 \text{ or } x=1.$$

Check... -

Completing the square.

$$(x+d)^2$$

$$= x^2 + \underbrace{2dx + d^2}_{\left(\frac{1}{2}2d\right)^2} \quad 5$$

Solve

$$x^2 - 8x = 1.$$

$$x^2 - 8x + 16 = 1 + 16$$

$$\underbrace{\quad}_{\left(\frac{1}{2}8\right)^2}$$

$$x^2 - 8x + 16 = 17$$

$$(x-4)^2 = 17.$$

$$x-4 = \pm \sqrt{17}$$

$$\underline{x = +4 \pm \sqrt{17}}$$