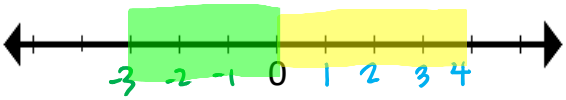
Name_____ Date_____

Section 1.4 – Absolute Value Equations

Alg 2 Trig G Notes

The **absolute value** of a number is: the distance from 0 on a number line

The **absolute value** of a number will always be: POSITIVE



$|4| = 4$

$|-3| = 3$

Evaluating absolute value expressions:

1. Evaluate $2.7+|6-2x|$ if $x=4$.

$2.7+|6-2(4)|$

$2.7+|6-8|$

$2.7+|-2|$

$2.7+2$ $\boxed{4.7}$

2. Evaluate $2.3-|3y-10|$ if $y=-2$.

$2.3-|3(-2)-10|$

$2.3-|-6-10|$

$2.3-|-16|$

$2.3-16$ $\boxed{-13.7}$

Solving absolute value equations: 2 ANSWERS!

3. $|y+3|=8$ ← OK

* get absolute value by itself
* write your 2 cases
* solve your 2 cases

CASE 1 (same without abs. value bars)

$y+3=8$
$-3 \quad -3$

$\boxed{y=5}$

CASE 2 (abs. value stays the same but take the opposite of the other side)

$y+3=-8$
$-3 \quad -3$

$\boxed{y=-11}$

4. $|2x+5|-4=11$
$+4 \quad +4$

$|2x+5|=15$ ← OK

CASE 1

$2x+5=15$

$2x=10$

$\boxed{x=5}$

CASE 2

$2x+5=-15$

$2x=-20$

$\boxed{x=-10}$

5. $|6-4t|+5=0$

$5 \quad -5$

$|6-4t| = -5$ not ok

negative

CASE 1

CASE 2

no solution

What if there are variables on both sides? must check your answers

6. $|8+y|=2y-3$

CASE 1

$8+y=2y-3$

$-y \quad -y$

$8=y-3$

$+3 \quad +3$

$\boxed{11=y}$ is a solution

CASE 2

$8+y=-2y+3$

$-y \quad -y$

$8=-3y+3$

$5=-3y$

$\boxed{-\frac{5}{3}=y}$ NOT a solution

Check your solutions! →

$|8+11|=2(11)-3$

$|19|=22-3$

$19=19$ ✓

$|8+\frac{-5}{3}|=2(\frac{-5}{3})-3$

$|6.33|=-3.33-3$

$6.33 \neq -6.33$

7. $-4x+37=|3x-5|$

CASE 1

$-4x+37=3x-5$

$+4x \quad +4x$

$37=7x-5$

$42=7x$

$\boxed{6=x}$ is a solution

CASE 2

$4x-37=3x-5$

$-3x \quad -3x$

$x-37=-5$

$\boxed{x=32}$ NOT A solution

Check your solutions! →

$-4(6)+37=|3(6)-5|$

$-24+37=|18-5|$

$13=|13|$

$13=13$ ✓

$-4(32)+37=|3(32)-5|$

$-128+37=|96-5|$

$-91=|91|$

$-91 \neq 91$