C11 - 7.0 - Absolute Values/Reciprocal Steps

Check Answer!

Absolute Values (Transformations*)

$y_1 = LHS$
$y_2 = RHS$
Calc
Find Intersection

"+" case: Distribute a positive into the absolute value

$+ve\ Case$

"−" case: Distribute a negative into the absolute value*

$-ve\ Case$

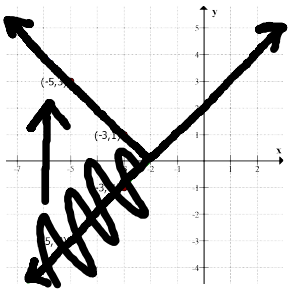
x	y
-3	1
-2	0
-1	1

$|-1| = 1$

Graph the Original first (TOV/Transformations)
Reflect $y - values$ Up/Down at Vertex

Math -> Num abs(

$y = |x + 2|$



Domain of positive case:
Set what is inside the absolute value greater than or equal to zero.

Domain of negative case:
Set what is inside the absolute value less than zero.

Piecewise function: Notice: The domain of the negative case is not equal to. $y = mx + b$

$$y = \begin{cases} \text{"+" case,} & \text{Domain of "+" case} \\ \text{"−" case,} & \text{Domain of "−" case} \end{cases}$$

$$y = \begin{cases} x + 2, if & x \geq -2 \\ -x - 2, if & x < -2 \end{cases}$$

Reciprocals (Rationals*)

Graph the Original first!!! (TOV/Transformations) $Circle:\ x - intercepts\ (x, 0)$

$y = x + 4$

$y = \dfrac{1}{x + 4}$

VA Vertical Asymptotes (VA) $= x -$ intercepts on the Original. $(x, 0)$ (Factor!)

Or

$Draw\ a\ Vertical\ Dotted\ Line$

VA: Set Denominator = 0 *and solve*
VA: $x = VA$
Domain: $x \neq VA$

$y = \dfrac{1}{x + 4}$

$x + 4 = 0$

$x = -4\ (VA)$

$Domain:\ x \neq -4$

IP Invariant Points: $(x, \pm 1)$

$Circle\ Points: Invariant\ Points\ (x, \pm 1)$

Every point with a y value of $+1, -1$

Or Set denominator $= \pm 1$ and solve Or Draw Horizontal lines Dotted Line(s): $y = 1$ and $y = -1$
Draw and circle Points on the Intersection of the Original and the Horizontal Lines

HA $Horizontal\ Asymptote:$ $Draw\ a\ horizontal\ dotted\ line\ at\ y = 0\ (The\ x - axis)(HA)$

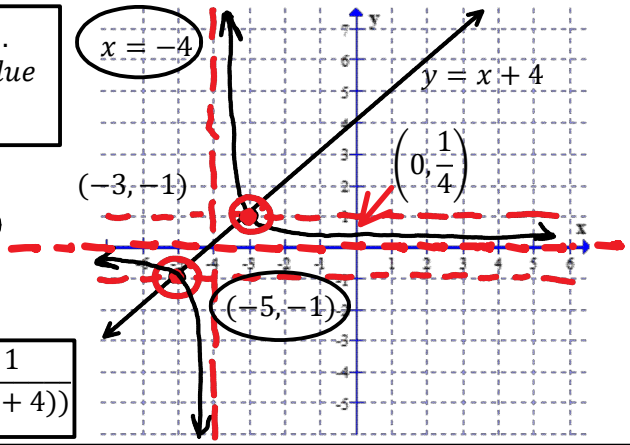
$y - int = \dfrac{1}{old\ y - int}$

$\left(0, \frac{1}{4}\right)$

x	y
-5	-1
-4	und
-3	-1

Pick an x value on f(x).
Do one over the y − value
Draw the new point.

$y = \dfrac{1}{x + 4}$



Ready to Graph
Close to VA Through Point, Close to $x - axis\ (HA)$
Range*: $y \neq 0$
Check on Graphing Calculator! Brackets!!!

$y = \dfrac{1}{((x + 4))}$