7.2 Absolute Value Functions

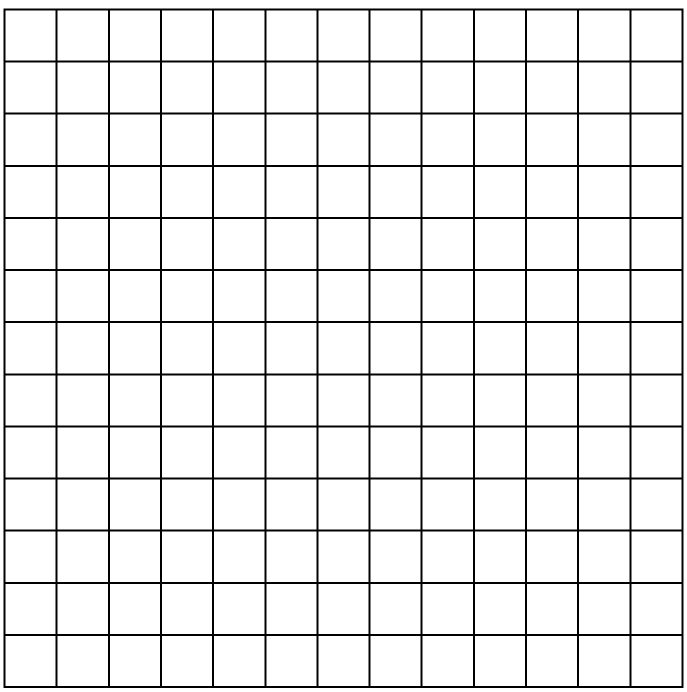
Graph an Absolute Function of the form y = |a x + b|

Example 1:

Given $y = |3x + 4|$

a.) Find y-intercept (x =0) and x-intercept (y = 0)

b.) Use table of values to sketch a graph.



c.) State the domain and range

d.) An **invariant point** is a point that remains unchanged after a transformation:
Compare the graph of y = 3x + 4 and y = |3x + 4|, where is the invariant point?

Does this apply for all absolute value functions in the form y = |ax + b| ?

e.) Express as a piecewise function

Recall:

$$f(x) = |x| = \begin{cases} x, & if\ x \geq 0 \\ -x, & if\ x < 0 \end{cases}$$

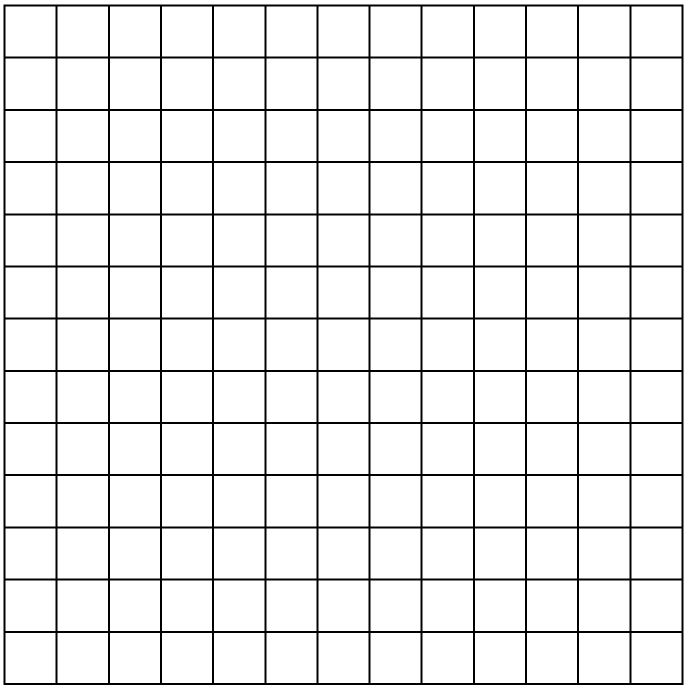
Look at the graphs of y = |3x + 4| and y = 3x + 4, which points are stay the same and which parts do we need to apply a negative sign to simplify?

Graph an Absolute Value quadratic function:

Example 2:

Given $y = |x^2 - 6x + 9|$

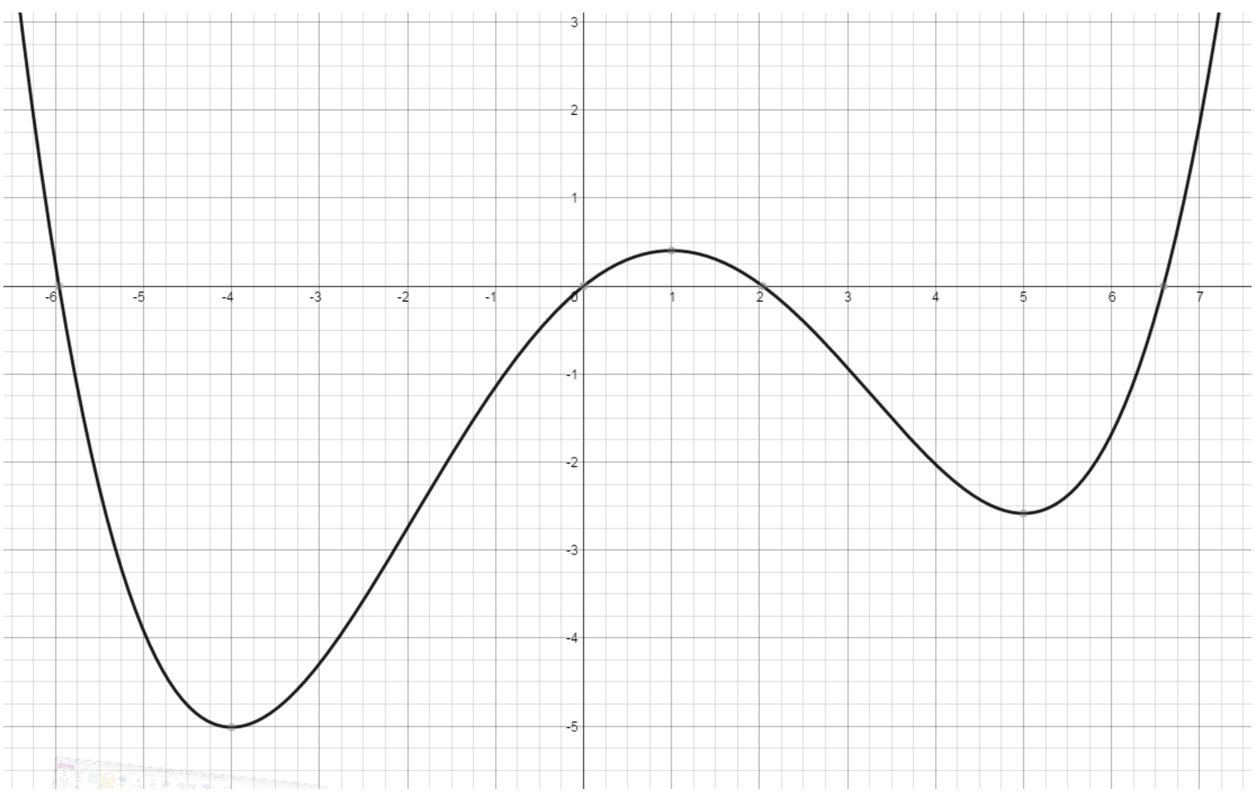
a.) Sketch the function without the absolute values.



b.) On the same graph, which parts change from a negative value to a positive value? Which parts remain positive? (*recall that we are only looking at the y-values/height of the graph) c.) Express the function as a piecewise function:

Example 3:

The graph below is $y = f(x)$, sketch $y = |f(x)|$



HW: p 375 1-15