Graphing Absolute Value Functions

These notes are intended as a supplement of chapter 4 in your workbook.

Absolute Value Functions

An absolute value function is any function of the form:

$$y = \left| f(x) \right|$$

It is a special transformation that changes all *y*-coordinates of points on $f(x)$ to their absolute value. In other words,

$$(x, y) \to (x, \ |y|)$$

This means:

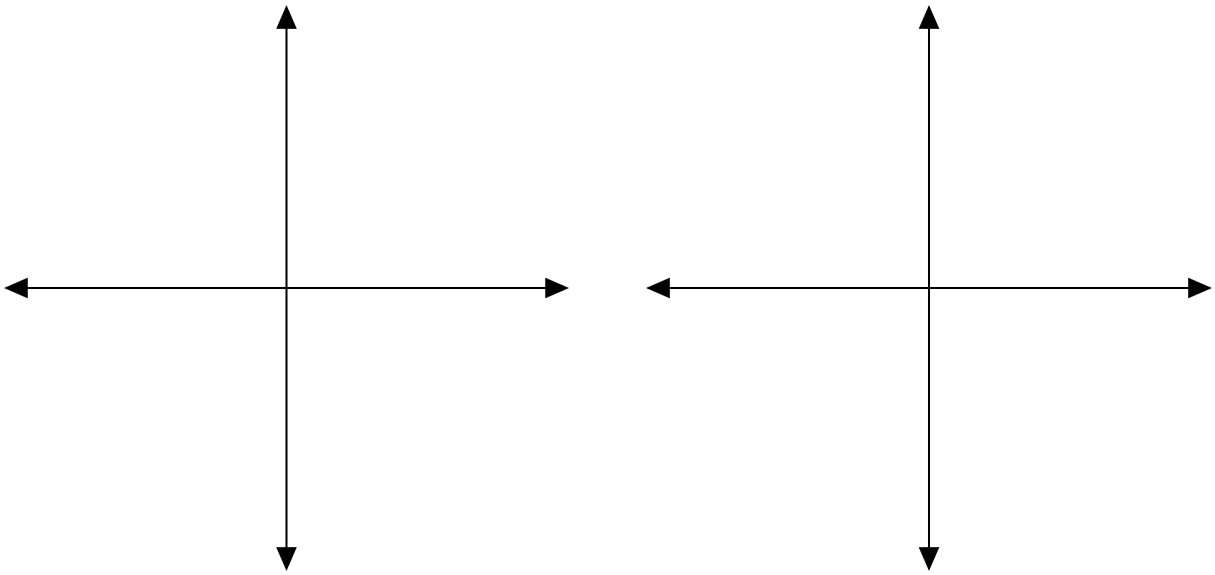
- points above the *x*-axis (where the *y*-coordinate is positive) do not change
- points below the *x*-axis (where the *y*-coordinate is negative) are reflected in the *x*-axis.

Graphing Absolute Value Functions

1. Draw the graph of $f(x)$ first, and label the *x* intercepts.
2. Reflect all parts of the graph whose *y*-coordinates are negative (below the *x*-axis) in the *x*-axis. Label at least one point on any section that you reflect.

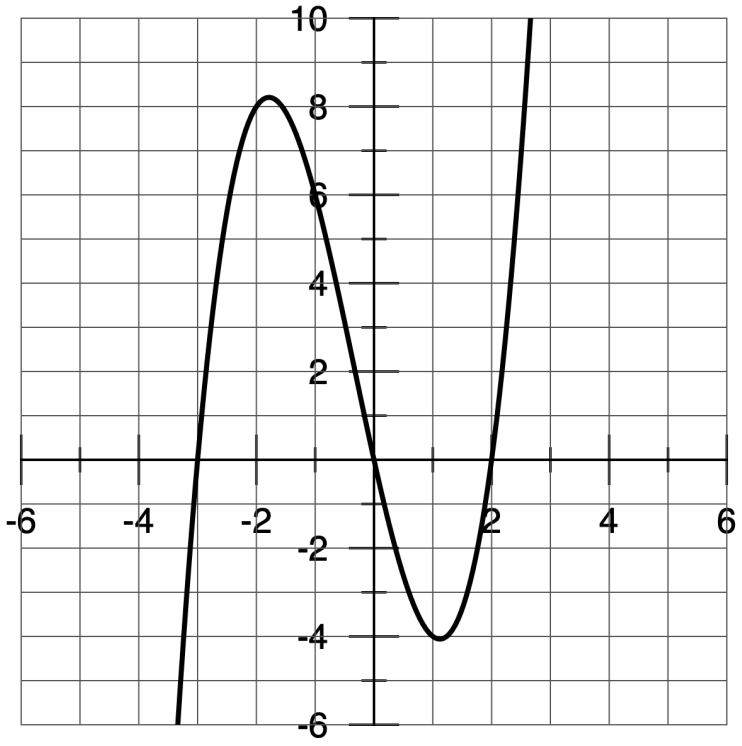
Example 1

Graph $y = |2x + 3|$.



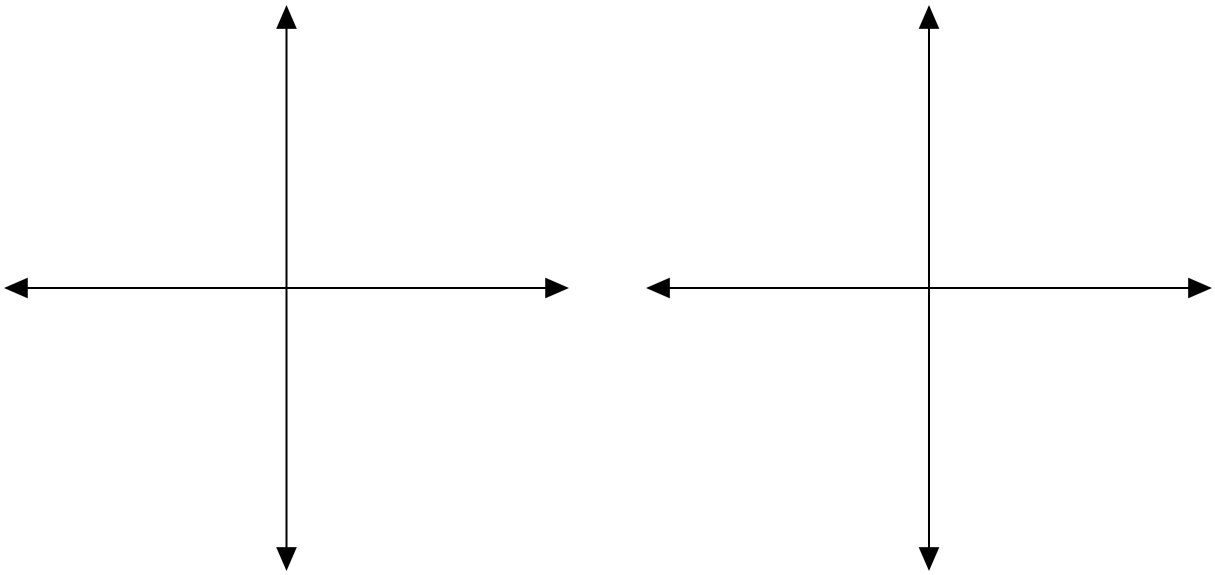
Example 2

Given $f(x) = x(x+3)(x-2)$, graph $y = |f(x)|$.



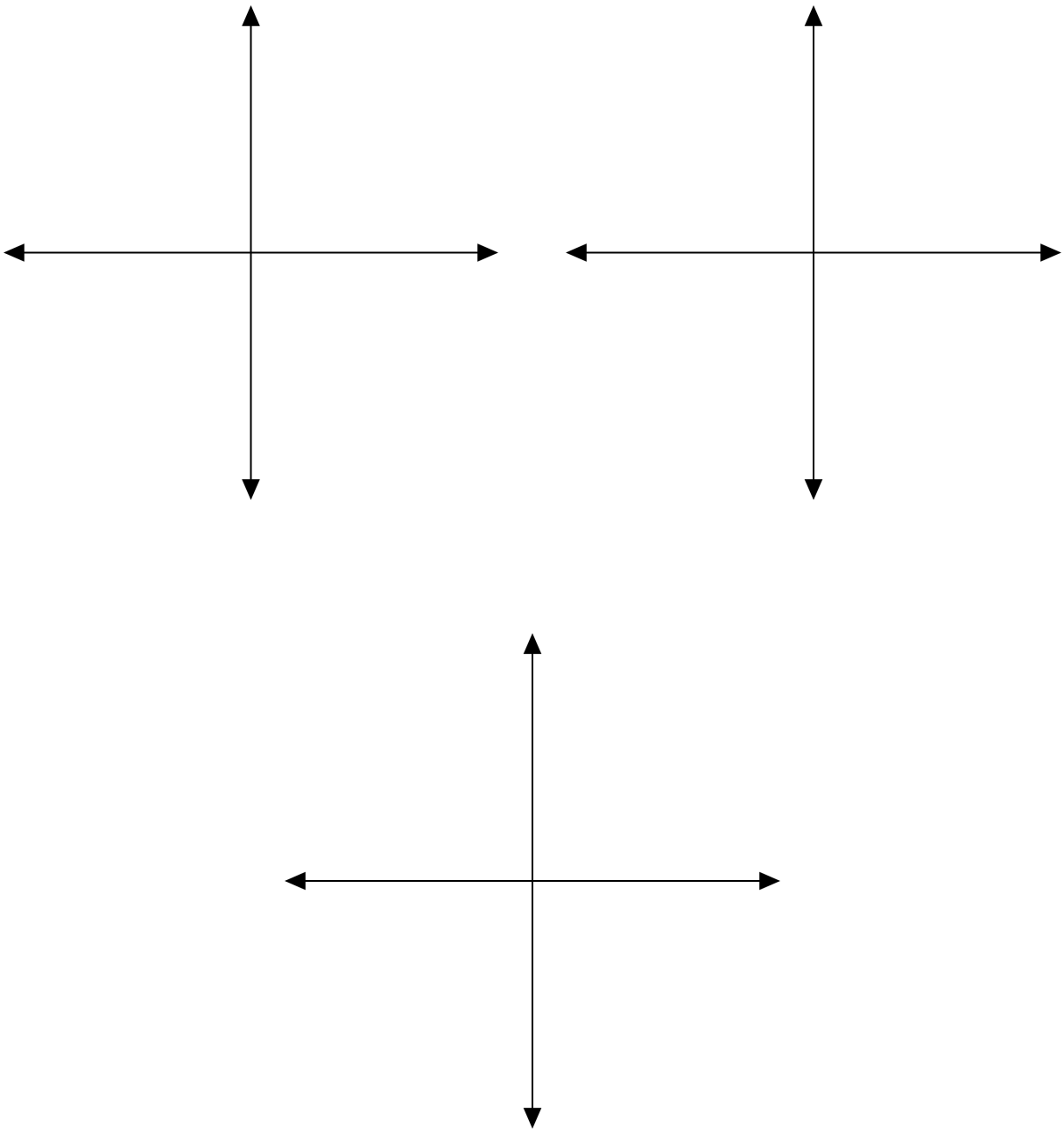
Example 3

Graph $y = \left|\sqrt{x} - 2\right| - 3$.



Example 4

Graph $y = \left|(x-2)^2 - 4\right| + 1$.



Homework: Supplemental Worksheet #13

Supplemental Worksheet #13

For each function $f(x)$ below, sketch the graph of $y=\left|f(x)\right|$.

1. $f(x)=3x-4$

2. $f(x)=(x-4)^2-3$

3. $f(x)=x(x+2)(x-3)$

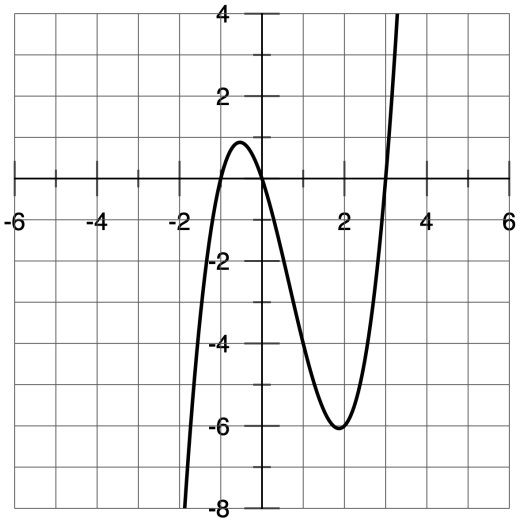
Graph each of the following:

4. $f(x)=\left|\sqrt{x+1}-4\right|-2$

5. $f(x)=\left|(x+3)^2-4\right|+2$

Given each graph of $f(x)$ below, sketch the graph of $y=\left|f(x)\right|$.

6.



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