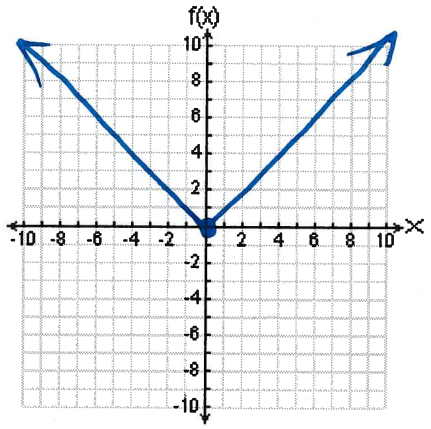
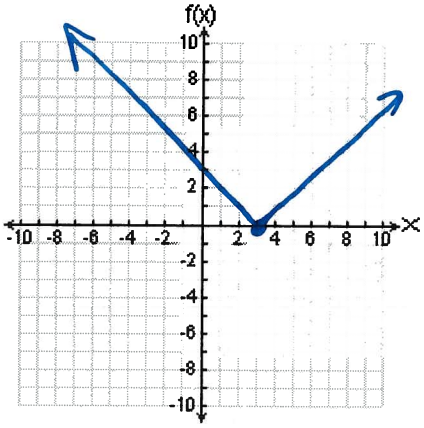
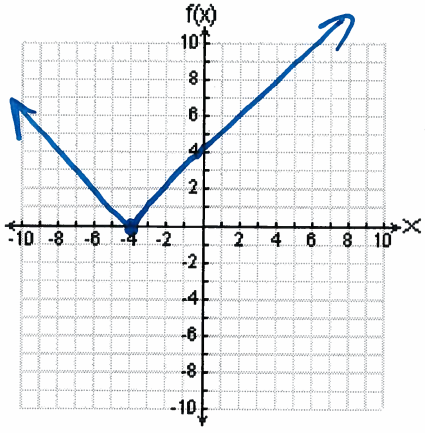
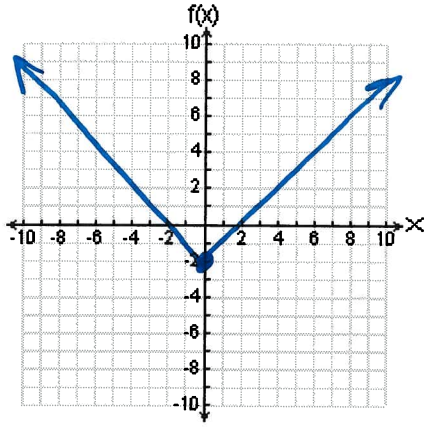
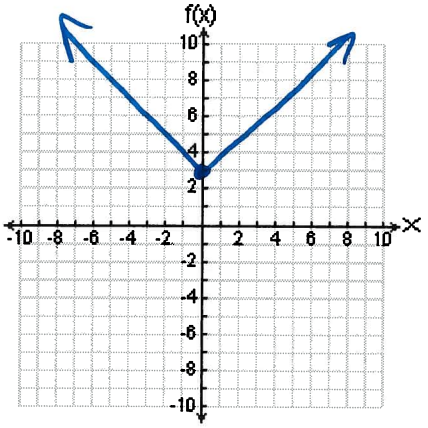
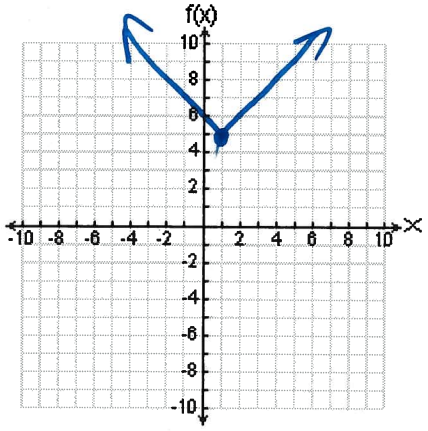
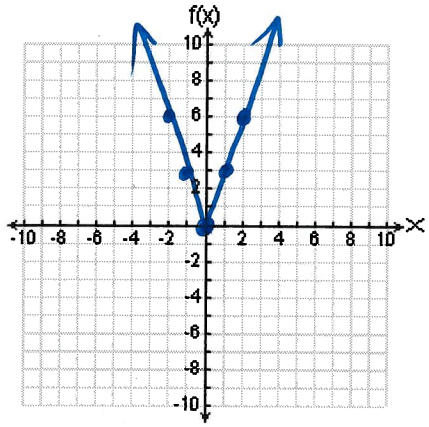
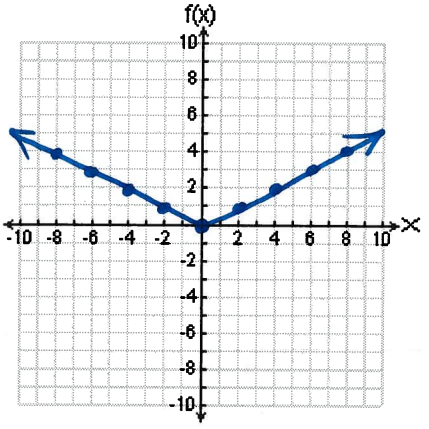
NOTES: GRAPH ABSOLUTE VALUE FUNCTIONS DAY 1

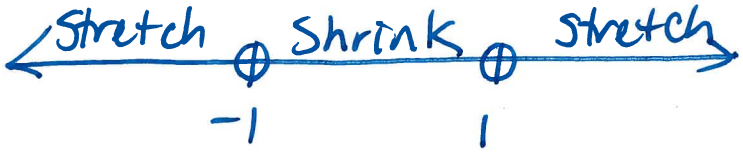
Textbook Chapter 2.7

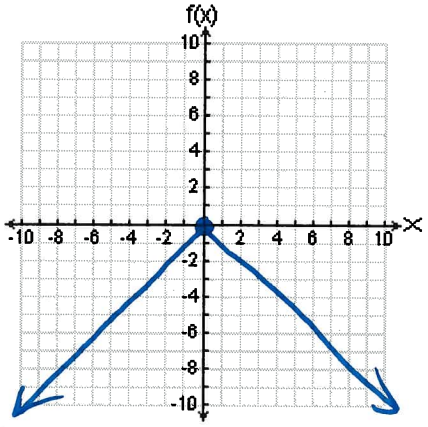
OBJECTIVE: Today you will review graphing absolute value functions!

1.	Graph the parent function: $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(0,0)$ Direction up	Sketch: 
2.	Graph: $f(x)=\|x-3\|$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(3,0)$ Direction up Transformation: Shift Right 3	Sketch: 
3.	Graph: $f(x)=\|x+4\|$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(-4,0)$ Direction up Transformation: Shift Left 4	Sketch: 
	When we add "inside" the function, the graph Shifts Left. **When we subtract "inside" the function, the graph** Shifts right.	

4.	Graph: $f(x)=\|x\|-2$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(0,-2)$ Direction up Transformation: Shift Down 2	Sketch: 
5.	Graph: $f(x)=\|x\|+3$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(0,3)$ Direction up Transformation: Shift up 3	Sketch: 
6.	Graph: $f(x)=\|x-1\|+5$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(1,5)$ Direction up Transformation: Right 1, up 5	Sketch: 
	When we add "outside" the function, the graph Shifts up **When we subtract "outside" the function, the graph** Shifts down	

7.	Graph: $f(x)=3\|x\|$ and $f(x)=\|x\|$ Describe: Slope ± 3 Vertex $(0,0)$ Direction up Transformation: Vertical Stretch	Sketch: 
8.	Graph: $f(x)=\frac{1}{2}\|x\|$ and $f(x)=\|x\|$ Describe: Slope $\pm \frac{1}{2}$ Vertex $(0,0)$ Direction up Transformation: Vertical Shrink	Sketch: 
	When we multiply "outside" the function by $\|a\|>1$**, the graph:** Stretches vertically **When we multiply "outside" the function by** $\|a\|<1$**, the graph:** Shrinks vertically	



9.	Graph: $f(x)=-\|x\|$ and $f(x)=\|x\|$ Describe: Slope ± 1 Vertex $(0,0)$ Direction Down Transformation: Reflect in x-axis	Sketch: 
	When there is a negative "outside" the function, the graph: Opens Down	

Putting it all together:

First identify what each value does: $y=a|x-h|+k$

a value: stretch/shrink
+a: opens up
-a: opens down

h: horizontal shift
+h: left
-h: right

k: vertical shift
+k: up
-k: down

12.	Graph: $f(x)=-\frac{1}{3}\|x+2\|-1$ and $f(x)=\|x\|$ Describe: Slope $\pm \frac{1}{3}$ Vertex $(-2,-1)$ Direction Down Transformation: Left 2, Down 1 Vertical Shrink Opens Down	Sketch: