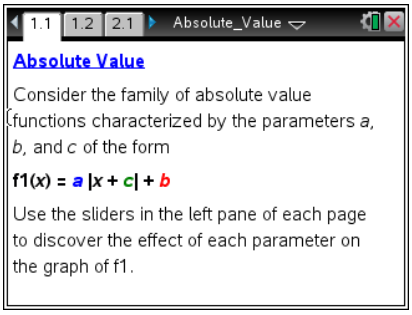
# Absolute Value

## Student Activity

Name _____

Class _____

**Open the TI-Nspire document *Absolute_Value.tns.***




The purpose of this activity is to examine the family of absolute value functions of the form $f(x) = a|x + c| + b$, where $a$, $b$, and $c$ are parameters. Use sliders in the left panel of each page to change the value of a parameter, and record the effect of each parameter on the graph of $y = f(x)$. At the end of this activity, use your results to match each function with its corresponding graph.

**Move to page 1.2.**

1. The graph of $y = \mathbf{f1}(x) = a \cdot |x|$ is shown in the right panel. Describe the graph of $y = |x|$. Grab and move the slider in the left panel, and observe the changes in the graph of **f1**. Describe the effect of the parameter $a$ on the graph of $y = a \cdot |x|$.

**Move to page 2.1.**

2. The graph of $y = \mathbf{f1}(x) = a|x| + b$ is shown in the right panel. Grab and move the slider for $a$ to confirm your results in question 1. Grab and move the slider for $b$,, and observe the changes in the graph of **f1**. Describe the effect of the parameter $b$ on the graph of $y = a|x| + b$.

**Move to page 3.1.**

3. The graph of $y = \mathbf{f1}(x) = a|x + c| + b$ is shown in the right panel. Grab and move the slider for $a$ to confirm your results in question 1. Grab and move the slider for $b$ to confirm your results in question 2. Grab and move the slider for $c$, and observe the changes in the graph of **f1**. Describe the effect of the parameter $c$ on the graph of $y = a|x + c| + b$.

4. Match each equation with its corresponding graph.

(a) $f(x) = -|x + 2| + 3$

(b) $f(x) = |x - 5| - 4$

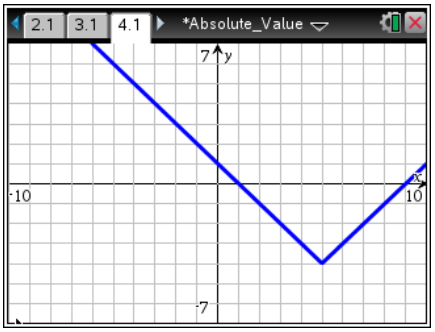
(c) $f(x) = 0.5|x - 4|$

(d) $f(x) = -2|x| + 5$

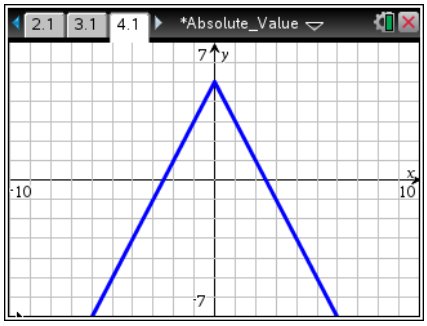
(e) $f(x) = -2|x - 3| - 1$

(f) $f(x) = -0.25|x + 4|$

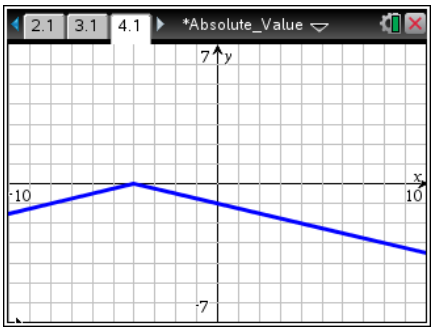
(i)



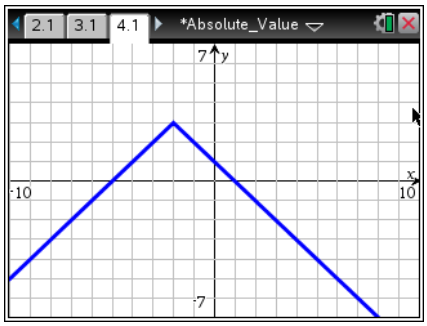

(ii)



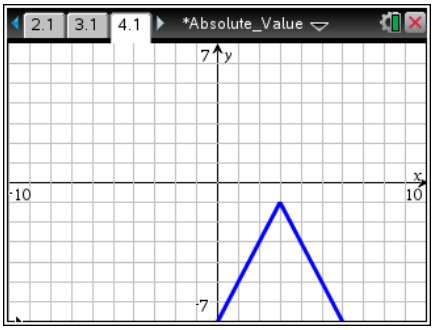

(iii)




(iv)




(v)




(vi)