Algebra 2 Unit 1 worksheet: Transforming the absolute value graph

Name _____ Date _____ Period _____

1. Write each rule in the form $y = a|x - h| + k$. Then give the axis of symmetry of its graph (the vertical line the V is symmetric about) and the y-intercept.

(a) $y = |6 - 2x|$

(b) $y = -\frac{1}{2}|4x + 8| + 3$

(c) $y = |-3x - 9| - 1$

(d) $y = 5 - \frac{1}{3}|3x - 12|$

2. Each arm of a V is a ray, part of a line.

(a) The right arm of a V lies on the line $y = 2x - 7$ and its left arm on the line $y = -2x + 5$. Find the vertex and write the rule of the V in the form $y = a|x - h| + k$.

(b) Write, in slope-intercept form, the equations of the two lines that carry the arms of $y = -\frac{1}{2}|x + 4| + 6$, and say for which inputs each arm is drawn.

3. Let $f(x) = 2|x - 3| + 1$.

(a) Reflect the graph of f across the y-axis. Write the new rule in the form $y = a|x - h| + k$ and give its vertex.

(b) Reflect the graph of f across the x-axis instead. Write the new rule and give its vertex and range.

4. Think about every graph $y = a|x - 1| + 3$, where a can be any number other than 0.

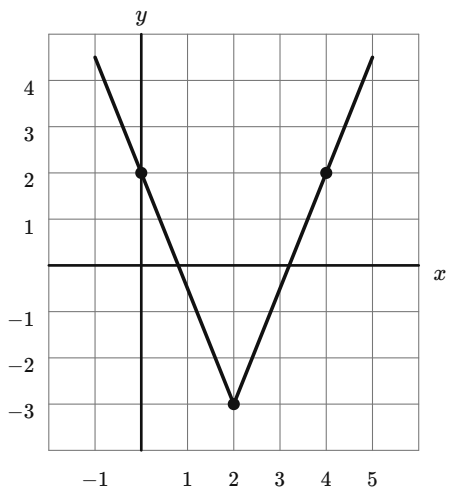
(a) Name the one point that is on every one of these graphs.

(b) For which values of a does the graph cross the x-axis? Explain.

(c) Find the value of a for which the two x-intercepts are 6 units apart.

Free sample from math.wiki for classroom use. Do not post. math.wiki

5. The figure shows part of the graph of a rule of the form $y = a|x - h| + k$. The three marked points sit on grid points.



(a) Write the rule.

(b) Find the x-intercepts exactly.

6. On graph paper, sketch $y = \dfrac{3}{2}|x - 2| - 3$ for $-2 \le x \le 4$ only, with a closed dot at each end. Mark the vertex, both endpoints and every intercept. Then give the range of this piece of the graph, and explain why it is not $y \ge -3$.

Free sample from math.wiki for classroom use. Do not post. math.wiki