

Name _____ Date _____ Period _____

Graphing $f(x) = |x|$ and Key Attributes - Practice

Algebra II Honors | Unit 2 | Lesson 1 Practice | TEK A2.2.A

Objective: I can analyze each piece of $f(x) = |x|$ on its own restricted domain, combine them into the domain and range of the whole function, and test even/odd algebraically.

Section 1 — Recall

1. Write the two pieces of $f(x) = |x|$, each with its own restricted domain.

$y =$ _____ on _____ $y =$ _____ on _____

2. Evaluate, stating which PIECE is used each time.

$f(-11) =$ _____ using _____ $f(6) =$ _____ using _____

3. Give the domain and range of $f(x) = |x|$ in interval notation.

Domain: _____ Range: _____

4. Complete the even/odd definitions.

Even when _____ Odd when _____

Section 2 — Apply

5. Give the range EACH piece produces on its own, then combine them.

$y = x$ on $x \geq 0$ gives _____ $y = -x$ on $x < 0$ gives _____

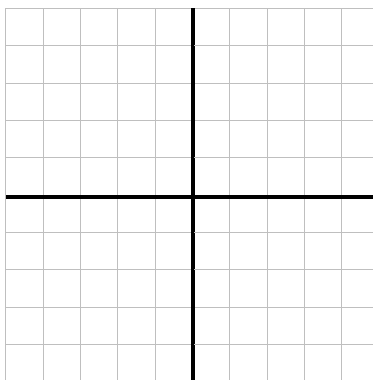
Combined: _____ Why is the second piece strictly > 0 ?

6. Test algebraically whether $f(x) = |x|$ is even, odd, or neither, and name the symmetry.

$f(-x) =$ _____ so f is _____

Symmetry: _____

7. Graph ONLY $y = x$ on $x \geq 0$ and ONLY $y = -x$ on $x < 0$, then mark the vertex.



Section 3 — Challenge

8. Case analysis. For which x is $|x| = x$? For which is $|x| = -x$? Justify from the piecewise definition.

$|x| = x$ when _____ $|x| = -x$ when _____

Why the two OVERLAP at $x = 0$: _____

9. Let $h(x) = |x| - |-x|$. Evaluate $h(-4)$ and $h(7)$, then determine $h(x)$ for every real x .

$h(-4) =$ _____ $h(7) =$ _____

$h(x)$ for every real x : _____

Section 4 — Explain It

10. Explain why $f(x) = |x|$ has a minimum value but a line $y = mx + b$ ($m \neq 0$) does not. Use the two pieces.
