Algebra 2 Unit 1 quiz 4: Symmetry about the vertical axis and the origin, Even and odd functions

Name _____ Date _____ Period _____

7 questions, 20 points

1. A graph is symmetric about the vertical axis. The points $(k+8, 4)$ and $(5k-20, 4)$ are on it, and each is the other's mirror partner (they are two different points). Find k and give both points. (2 points)

2. A function f has domain $-7 \le x \le 7$, and its graph is symmetric about the origin. For $0 \le x \le 7$ the graph is made of line segments joining (0, 0), (2, 4), (5, 1) and (7, 3) in that order. (3 points)

(a) Give the corners of the graph for $-7 \le x \le 0$, and the range of f.

(b) Find every x with $f(x) = 2$.

(c) Find every x with $f(x) = -1$.

3. Let $f(x) = 4x^3 - 7x$ and $g(x) = 4x^3 - 7x - 1$. (3 points)

(a) Simplify $f(-x)$ and decide whether f is even, odd or neither.

(b) Find $g(-1)$ and $-g(1)$.

(c) Is g even, odd or neither? Explain.

4. Decide whether each function is even, odd or neither. Show the work that decides it.

(a) $f(x) = \dfrac{x^3}{|x|+1}$ (b) $g(x) = \sqrt{x^4+1} - 2$

(c) $h(x) = \sqrt{x^2+6x+9}$ (3 points)

5. The point (−2, 1) is on the graph of $xy^2 - x^3 = 6$. (3 points)

(a) Test the graph for symmetry about the x-axis, the y-axis and the origin. For each symmetry it lacks, use a partner of (−2, 1) to prove it.

(b) Name one more point on the graph, and explain why the graph is not the graph of a function.

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6. Isaac copied this table for a function whose graph is symmetric about the origin. Exactly one entry was copied wrong. (3 points)

x	-3	-2	-1	0	1	2	3
$f(x)$	8	-1	4	1	-4	1	-8

(a) Which entry is wrong, and what should it be?

(b) Could the table instead belong to a function symmetric about the vertical axis, with only one entry copied wrong? Explain.

7. Here is a table for a function g with a point above every x. (3 points)

x	-1	0	1	2	3	4	5
$g(x)$	6	1	-2	-3	-2	1	6

(a) Use the table to show that the graph of g is not symmetric about the vertical axis.

(b) Find the number h for which the graph of $y = g(x + h)$ is symmetric about the vertical axis, as far as the table shows, and give the table of $g(x + h)$ for $x = -3$ to 3.

(c) Can a vertical shift, $y = g(x) + c$, make the graph symmetric about the vertical axis? Explain.

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