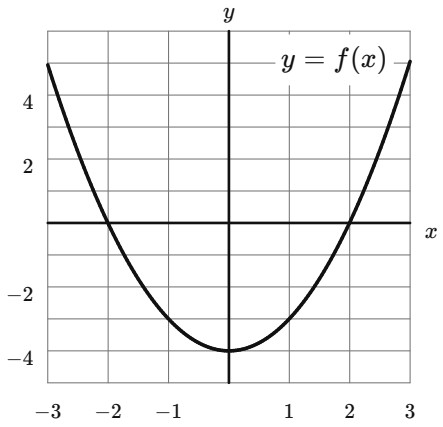
Algebra 2 Unit 1 worksheet: Symmetry about the vertical axis and the origin

Name _____ Date _____ Period _____

1. Each table is for a function whose graph is symmetric about the vertical axis or about the origin. For each table, decide which symmetry it has, naming the entries that decide it, and fill in every missing entry the symmetry forces. If the entries shown cannot decide, say so, and fill in only the entries that come out the same either way.

x	-3	-2	-1	0	1	2	3
$p(x)$	7	?	-2	?	2	-4	?
$q(x)$	?	6	?	3	1	6	-5
$r(x)$	?	?	8	0	?	0	5

2. Mia graphs $f(x) = \dfrac{x^3}{500} + x^2 - 4$ on the window $-3 \le x \le 3$ shown. She says the graph is symmetric about the vertical axis, because the left and right halves look like mirror images.



(a) Find $f(10)$ and $f(-10)$. What do they show about Mia's claim?

(b) Find $f(3) - f(-3)$ exactly, and explain why the figure does not show the difference.

(c) Is the graph symmetric about the origin? Use one point to decide.

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3. The functions f and h each have a point above every x. The graph of f is symmetric about the vertical axis, and the graph of h is symmetric about the origin. Some of their values:

x	-2	-1	0	1	2
$f(x)$	5	0	-3	0	5
$h(x)$	-6	2	0	-2	6

For each new function, decide whether its graph keeps the symmetry of the function it is built from (the vertical axis for one built from f, the origin for one built from h). If it keeps it, explain why each partner pair is still a partner pair and give one pair from the table. If it breaks it, give a point on the new graph whose partner is missing.

(a) $y = f(x) + 4$

(b) $y = f(x - 1)$

(c) $y = -2f(x)$

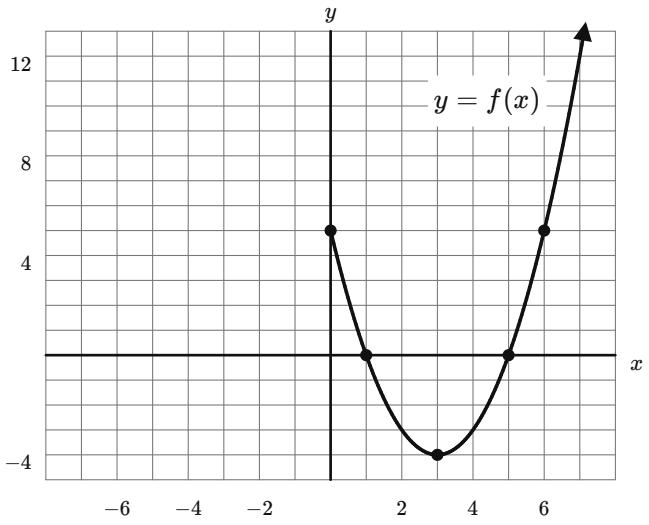
(d) $y = f(3x)$

(e) $y = h(x) + 4$

(f) $y = -2h(x)$

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4. The figure shows only the part of the graph of a function f for $x \geq 0$, where $f(x) = x^2 - 6x + 5$. The whole graph has a point above every x and is symmetric about the vertical axis.



(a) Find $f(-4)$ and $f(-3)$.

(b) Find every x with $f(x) = 12$.

(c) Find every x with $f(x) < 0$.

(d) Give the lowest points of the whole graph, and every stretch of x on which the whole graph rises.

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