

Handout 7: 2.3 Toolkit Functions and Symmetry

1. Sketch a graph of each piecewise-defined function.

$$\text{a. } h(t) = \begin{cases} -0.5t - 2, & t > 2 \\ \frac{1}{t}, & 0 < t \leq 2 \\ t, & t \leq 0 \end{cases} \quad \text{b. } q(x) = \begin{cases} x^2, & |x| < 2 \\ 2^x, & x \geq 2 \end{cases}$$

2. Suppose $g(x)$ is linear and $g(3) = 4$ and $g(-2) = 0$.

a. Graph $g(x)$.

b. Write an equation for $g(x)$.

3. Suppose $h(x)$ is linear and you know $h(0) = -2$ and that $h(x + 4) - h(x) = -6$ for all x .

a. Graph $h(x)$.

b. Write an equation for $h(x)$.

4. Graph $l(x) = 3x + 2$.

a. What would $l(x + 1) - l(x)$ be for all x ?

b. What would $l(x + 3) - l(x)$ be for all x ?

c. What would $l(x - 2) - l(x)$ be for all x ?

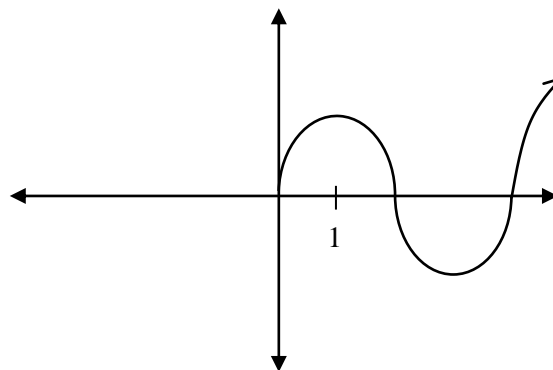
5. The graph shows the function k for which $x \geq 0$.

Sketch the graph of k for all x

a. if k is an even function.

b. if k is an odd function.

c. if k is symmetric about $x = 1$.



6. Determine what type of symmetry each of the functions below has.

a.

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

b.

t	$P(t)$
-3	4
-2	0
-1	1
0	6
1	1
2	0
3	4

c.

r	$s(r)$
-1	1
-2	6
-3	-5
1	-1
2	-6
3	5

7. If $f(x)$ is symmetric about the line $x = -3$ and the point $(1,1)$ is on its graph, what other point must be on the graph ?

8. Determine whether the following are even, odd or neither, algebraically.

a. $p(x) = x^2 + 7$

c. $q(t) = (t - 3)^2$

b. $r(n) = \frac{n}{n^5}$

d. $w(x) = x^3 + 5x$

9. Given a function $f(x)$, determine the symmetry of

a. $g(x) = -2[f(x) + f(-x)]$ and

b. $h(x) = -2[f(x) - f(-x)]$.