

Homework 2-7

Even and Odd Functions Algebraically

1. Given the partially filled out table below for $f(x)$, fill out the rest of it based on the function type.

(a) Even \rightarrow exact

x	-3	-2	-1	0	1	2	3
y	5	-4	-7	4	-7	-4	5

(b) Odd \rightarrow opposite

x	-3	-2	-1	0	1	2	3
y	5	4	-7	0	7	-4	-5

2. If $f(x)$ is an even function \rightarrow exact and $f(3) = 5$ then what is the value of $4f(3) + 2f(-3)$?

(1) 30

(3) 10

(2) 60

(4) 6

$$4(5) + 2(5) \\ 20 + 10 \\ 30$$

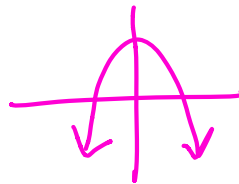
3. Which of the following functions is even? Explain how you arrived at your choice.

(1) $y = x^2 - 4x$

(3) $y = 9 - x^2$

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

(4) $y = 4^x$



4. Algebraically determine whether the function $f(x) = x^5 - 3x^3 + x$ is odd, even, or neither.

plug in
-x

$$(-x)^5 - 3(-x)^3 + (-x) \\ -x^5 + 3x^3 - x$$

opposite
 \rightarrow odd

5. Algebraically determine whether the function $f(x) = -x^4 - 6$ is odd, even, or neither.

$$-(-x)^4 - 6 \\ -x^4 - 6$$

exact
 \rightarrow even

6. Determine if the function $f(x) = \frac{4x^2 + 2}{x}$ is even or odd. You might want to explore the function using tables on your calculator. Provide evidence for your final choice.

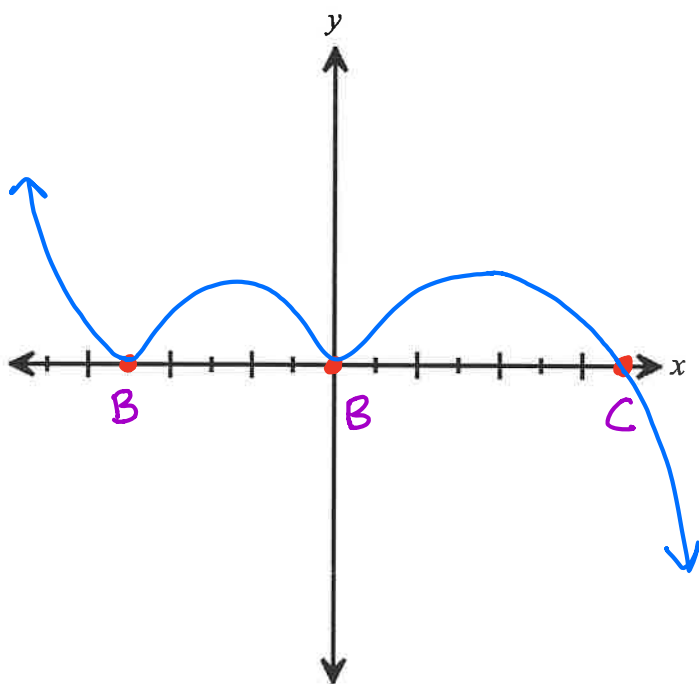
x	-3	-2	-1	0	1	2	3
y	$-\frac{35}{3}$	-9	-6	error	6	9	$\frac{35}{3}$

opposite
odd

7. Even functions have symmetry across the y-axis. Odd functions have symmetry across the origin. Can a function have symmetry across the x-axis? Why or why not?

No, if a graph was symmetric with respect to the x-axis it would not be a function!
(wouldn't pass the vertical line test)

8. Sketch the function $f(x) = -x^2(x-7)(x+5)^2$



x=0 x=7 x=-5
M=2 M=1 M=2
B C B

Degree: 5 (odd)
negative
↑ ↓

☐ I got

☐ I almost got it...

☐ I need more practice...

☐ I don't get it... Help!