

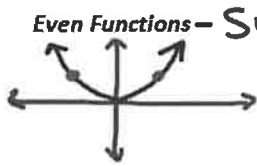
<https://www.khanacademy.org/math/algebra2/polynomial-functions/introduction-to-symmetry-of-functions/v/recognizing-odd-and-even-functions>

**EVEN ODD NEITHER**

Name: \_\_\_\_\_

Period: \_\_\_\_\_ Date: \_\_\_\_\_

How do you determine if a graph represents a function that is *even*, *odd* or *neither*?



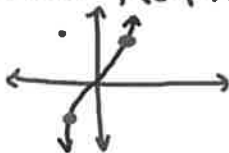
Even Functions - Symmetric to the y-axis.

Algebraically:  $f(-x) = f(x)$

Ex:  $f(x) = -x^4 + 6x^2 - 7$

$f(-x) = -(-x)^4 + 6(-x)^2 - 7$   
 $= -x^4 + 6x^2 - 7$

Odd Functions Symmetric to the origin.  
 "Double Reflect"



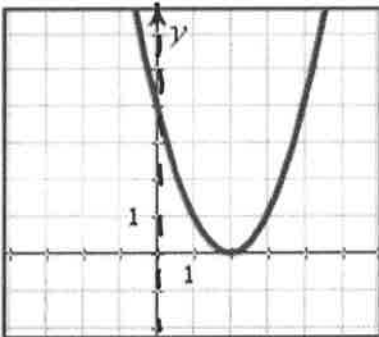
Algebraically:  $f(-x) = -f(x)$

Ex:  $f(x) = 3x^5 - 4x^3 + 9x$

$f(-x) = 3(-x)^5 - 4(-x)^3 + 9(-x)$   
 $= -3x^5 + 4x^3 - 9x$

Determine if the following graph represents an even function, an odd function or neither type of function. Explain your reasoning.

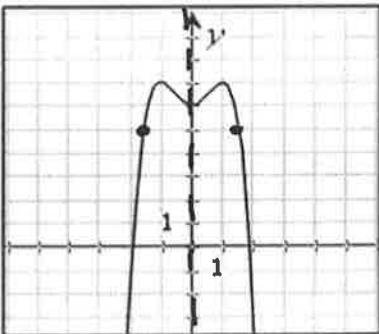
1.



Type: Even, Odd or Neither

Reasoning: No symmetry → y-axis  
→ origin

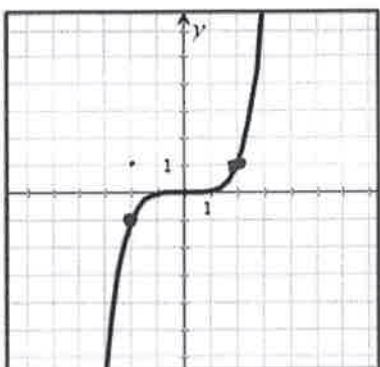
2.



Type: Even, Odd or Neither

Reasoning: y-axis symmetry

3.



Type: Even, Odd or Neither

Reasoning: Double Reflection

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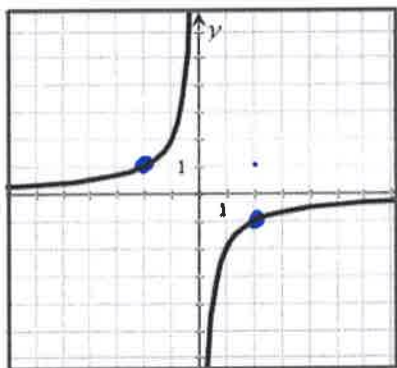


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4.



Type: Even, Odd or Neither

Reasoning: Double Reflection

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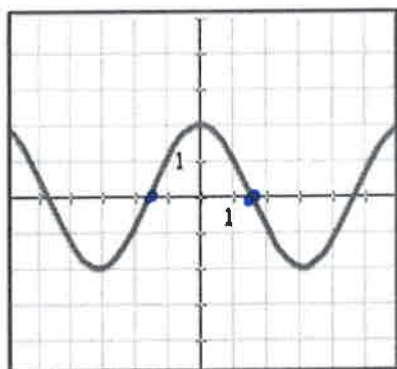


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5.



Type: Even Odd or Neither

Reasoning: Reflect over y-axis

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$$f(-x)$$

Determine if the function is even, odd or either and justify your answer.

6.  $f(x) = 4x^4 - 3x^2 + 9$   
 Same  
 $f(-x) = 4(-x)^4 - 3(-x)^2 + 9$   
 $= 4x^4 - 3x^2 + 9$

Even

7.  $f(x) = 7x - 0.5$

$$f(-x) = 7(-x) - 0.5$$

$$= -7x - 0.5$$

Neither

8.  $f(x) = 8x^2 - 5|x| + 2$

$$f(-x) = 8(-x)^2 - 5|-x| + 2$$

$$= 8x^2 - 5|x| + 2$$

Even

9.  $f(x) = 6x^7 - 4x^3 + 11x$

$$f(-x) = 6(-x)^7 - 4(-x)^3 + 11(-x)$$

$$= -6x^7 + 4x^3 - 11x$$

Odd

10.  $f(x) = \sqrt{7x^3 + 4x} - 2$

$$f(-x) = \sqrt{7(-x)^3 + 4(-x)} - 2$$

$$= -\sqrt{7x^3 + 4x} - 2$$

Neither

11.  $f(x) = -0.6x^5 + 8x^3 - \frac{x}{3}$

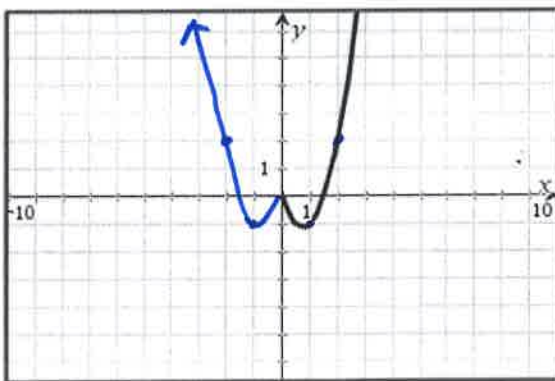
$$f(-x) = -0.6(-x)^5 + 8(-x)^3 - \frac{-x}{3}$$

$$= 0.6x^5 - 8x^3 + \frac{x}{3}$$

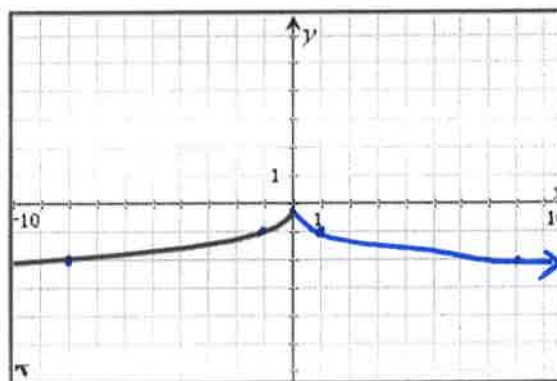
Odd

Complete the graph so that the function is even.

12.

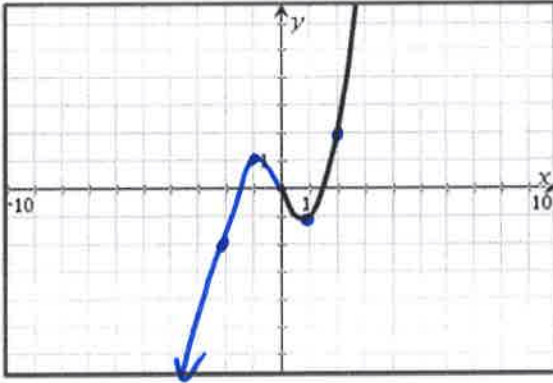


13.

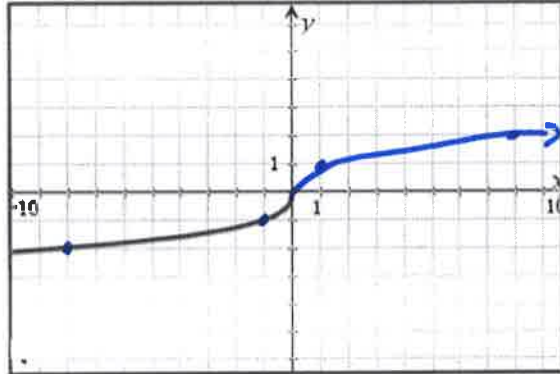


Complete the graph so that the function is odd.

14.

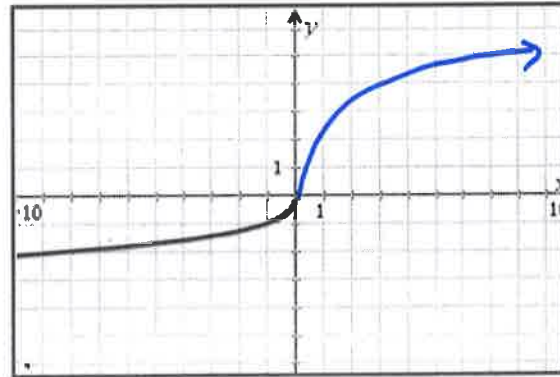
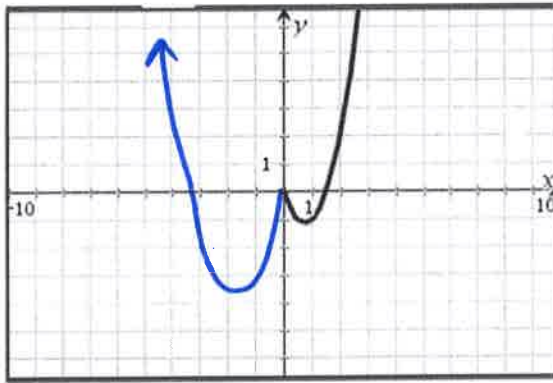


15.



Complete the graph so that the function is neither

16.



# EVEN ODD NEITHER Day 2

Name: \_\_\_\_\_

Practice

Period: \_\_\_\_\_ Date: \_\_\_\_\_

In exercises 1 – 6 determine if the function is even, odd, or neither. Support your answer with algebraic justification.

1.  $f(x) = x^3 - 3x$   
 $f(-x) = (-x)^3 - 3(-x)$   
 $= -x^3 + 3x$   
 odd

2.  $f(x) = 5x^2 + x^4$   
 $f(-x) = 5(-x)^2 + (-x)^4$   
 $= 5x^2 + x^4$   
 EVEN

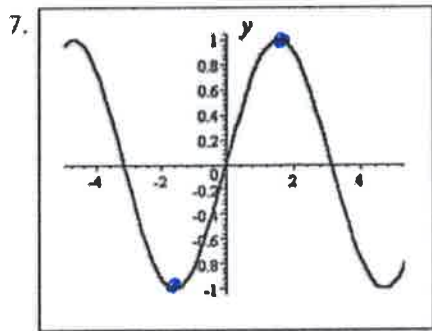
3.  $f(x) = \sqrt{2x^4 + 2}$   
 $f(-x) = \sqrt{2(-x)^4 + 2}$   
 $= \sqrt{2x^4 + 2}$   
 even

4.  $f(x) = x + \frac{5}{x}$   
 $f(-x) = (-x) + \frac{5}{(-x)}$   
 $= -x - \frac{5}{x}$  odd

5.  $f(x) = 0.74x^2 + |x| - 5$   
 $f(-x) = 0.74(-x)^2 + |-x| - 5$   
 $= 0.74x^2 + |x| - 5$   
 even

6.  $f(x) = 8x^4 + 5x + 4$   
 $f(-x) = 8(-x)^4 + 5(-x) + 4$   
 $= 8x^4 - 5x + 4$   
 Neither

In exercises 7 – 9 determine if the function is even, odd, or neither. Support your answer .



Type: Even, Odd or Neither

Reasoning: Double reflection

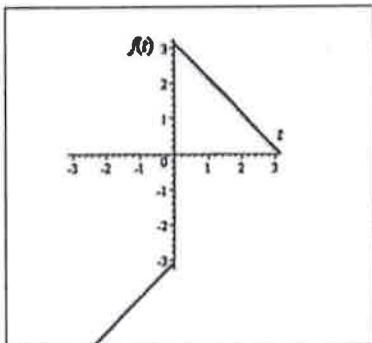
\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

8.



Type: Even, Odd or Neither

Reasoning: No symmetry

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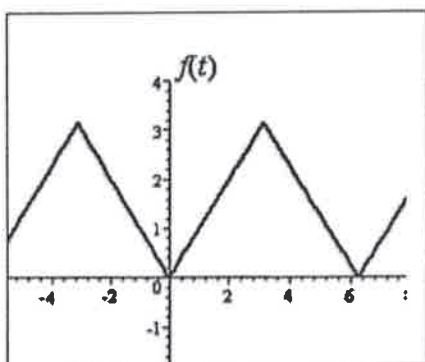


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9.



Type: Even, Odd or Neither

Reasoning: Reflects over y-axis

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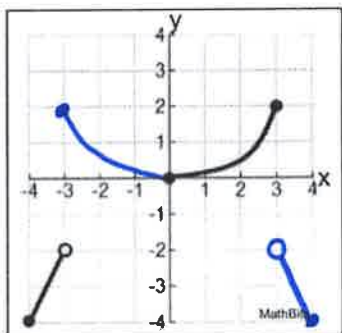
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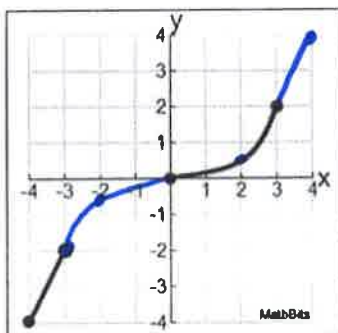
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In exercises 10 – 12 complete the graph so that the function meets the listed requirement .

10. Even



11. Odd



12. Neither

