

Activity 3: Characteristics of Odd and Even functions**Homework**

For each of the following functions, classify each as: even, odd or neither. You must show your work to prove your classification. If you are experiencing difficulty, contact your teacher.

1. Show a proof algebraically

a) $f(x) = x^2 - 2x$

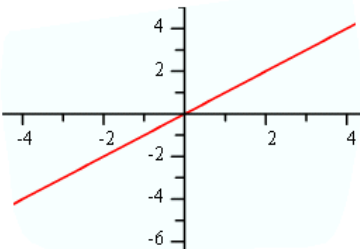
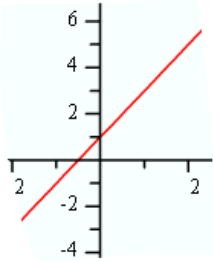
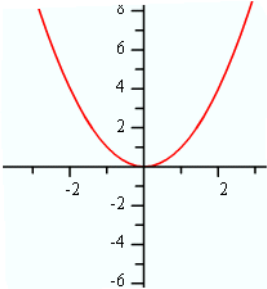
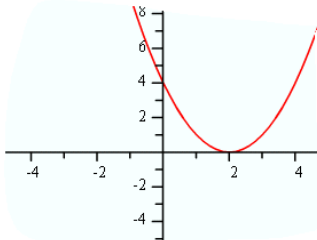
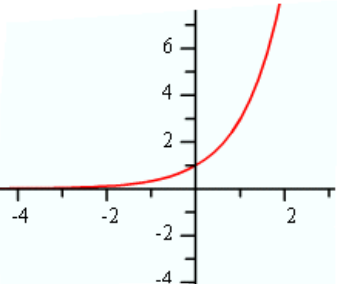
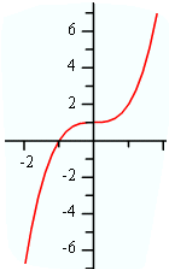
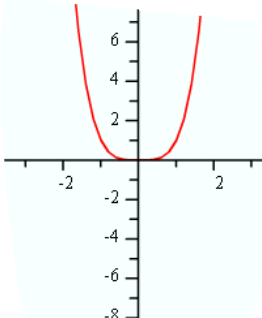
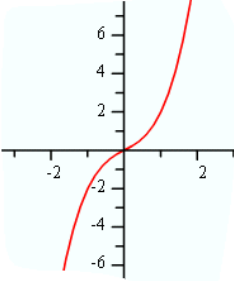
b) $f(x) = 3x^5 - 4x$

c) $f(x) = \frac{1}{x^2 + 5}$

d) $f(x) = \frac{x}{x^2 - 3}$

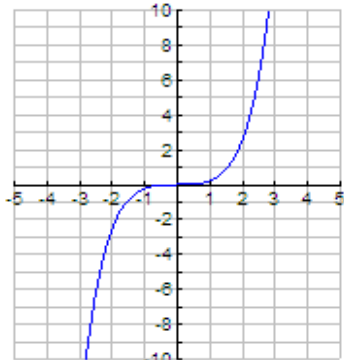
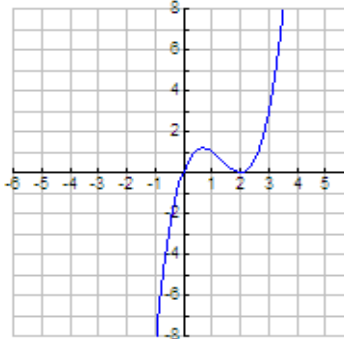
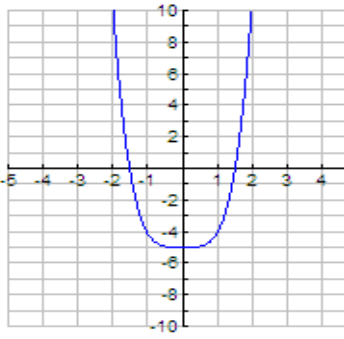
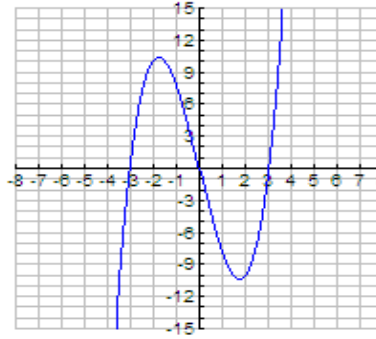
e) $f(x) = \frac{1}{x^3 - 5}$

2. Decide if these are even or odd or neither from the graph

Functions	Even/Odd/Neither	Functions	Even/Odd/Neither
<p>a)</p> 		<p>e)</p> 	
<p>b)</p> 		<p>f)</p> 	
<p>c)</p> 		<p>g)</p> 	
<p>d)</p> 		<p>h)</p> 	

Evens and Odds – Practice

Determine whether each of the functions below is even, odd or neither. Justify your answers.

1.		2.	
3.		4.	
5.	$f(x) = 3x^2 + 4$	6.	$f(x) = -2x + 5$
7.	$f(x) = 2x^2 + 3x$	8.	$f(x) = -3x^3 + x$



Homework Solutions

For each of the following functions, classify each as: even, odd or neither. You must show your work to prove your classification. If you are experiencing difficulty, contact your teacher.

1.

a)

$$f(x) = x^2 - 2x$$

$$f(-x) = (-x)^2 - 2(-x) = x^2 + 2x$$

$$-f(x) = -(x^2 - 2x) = -x^2 + 2x$$

$$f(x) \neq f(-x) \neq -f(x)$$

$\therefore f(x)$ is neither.

c)

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

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

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

$$f(-x) = -f(x)$$

$\therefore f(x)$ is odd.

c)

$$f(x) = \frac{1}{x^2 + 5}$$

$$f(-x) = \frac{1}{(-x)^2 + 5} = \frac{1}{x^2 + 5}$$

$$-f(x) = -\left(\frac{1}{x^2 + 5}\right) = \frac{-1}{x^2 + 5}$$

$$f(x) = f(-x)$$

$\therefore f(x)$ is even.

d)

$$f(x) = \frac{x}{x^2 - 3}$$

$$f(-x) = \frac{(-x)}{(-x)^2 - 3} = \frac{-x}{x^2 - 3}$$

$$-f(x) = -\left(\frac{x}{x^2 - 3}\right) = \frac{-x}{x^2 - 3}$$

$$f(-x) = -f(x)$$

$\therefore f(x)$ is odd.

e)

$$f(x) = \frac{1}{x^3 - 5}$$

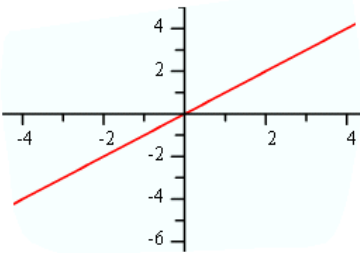
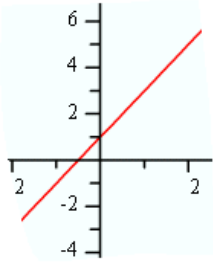
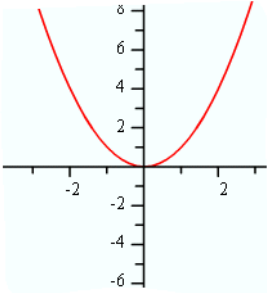
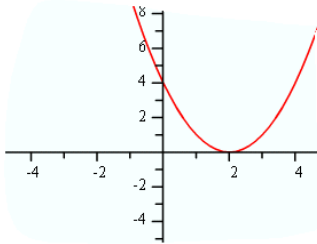
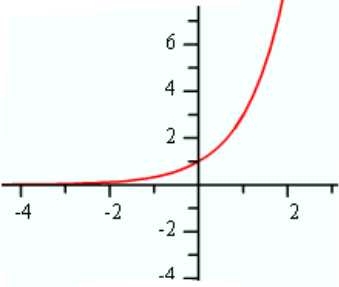
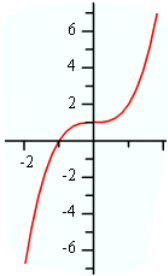
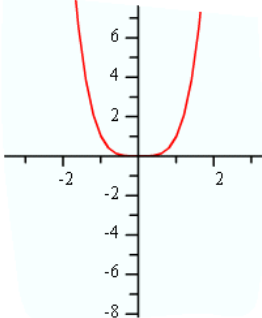
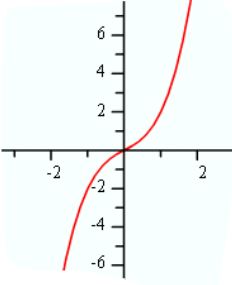
$$f(-x) = \frac{1}{(-x)^3 - 5} = \frac{1}{-x^3 - 5}$$

$$-f(x) = -\left(\frac{1}{x^3 - 5}\right) = \frac{-1}{x^3 - 5}$$

$$f(x) \neq f(-x) \neq -f(x)$$

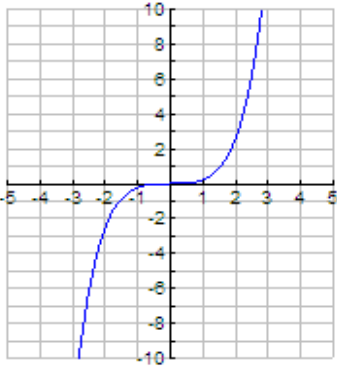
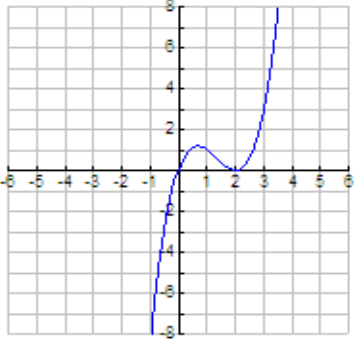
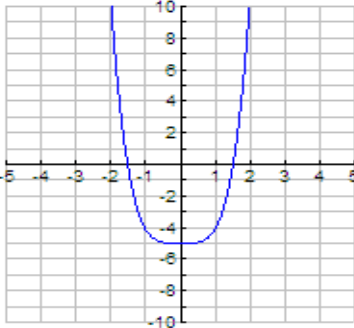
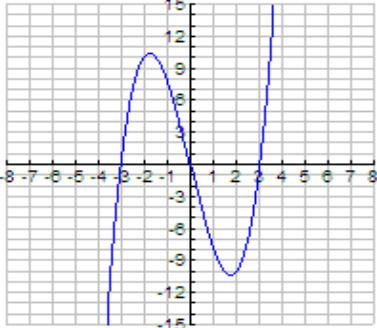
$\therefore f(x)$ is neither.

2. Decide if these are even or odd or neither from the graph

Functions	Even/Odd/Neither	Functions	Even/Odd/Neither
<p>a)</p> 	Odd	<p>e)</p> 	Neither
<p>b)</p> 	Even	<p>f)</p> 	Neither
<p>c)</p> 	Neither	<p>g)</p> 	Neither
<p>d)</p> 	Even	<p>h)</p> 	odd

Evens and Odds – Practice

Determine whether each of the functions below is even, odd or neither. Justify your answers.

1.	odd 	2.	neither 		
3.	Even 	4.	Odd 		
5.	$f(x) = 3x^2 + 4$ even		6.	$f(x) = -2x + 5$ neither	
7.	$f(x) = 2x^2 + 3x$ <i>neither</i>		8.	$f(x) = -3x^3 + x$ odd	