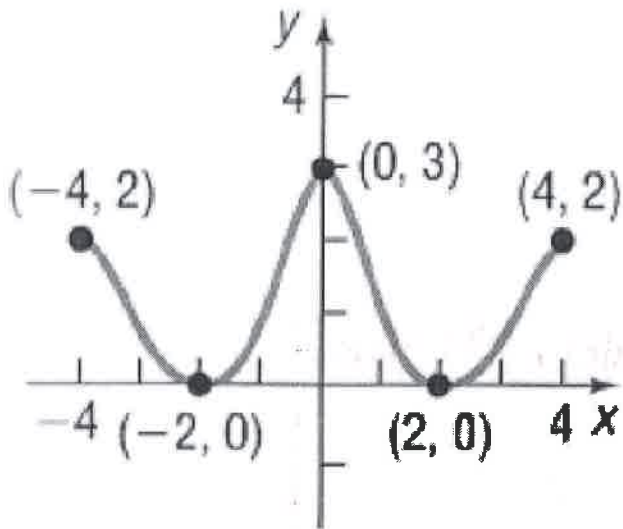


Objective: Determining whether a function is even, odd, both, or neither.

Warm Up: Analyze the key features of the following graph.



Maximums/Minimums:

Rel max: $(-4, 2), (0, 3), (4, 2)$ Rel min: $(-2, 0), (2, 0)$

Abs max: $(0, 3)$ Abs min: $(-2, 0), (2, 0)$

Increasing:

$(-2, 0) \cup (2, 4)$

Decreasing:

$(-4, -2) \cup (0, 2)$

Intercepts:

x-int: $(-2, 0), (2, 0)$

y-int: $(0, 3)$

Domain:

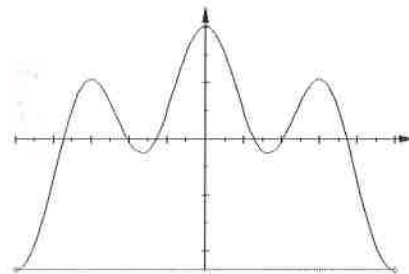
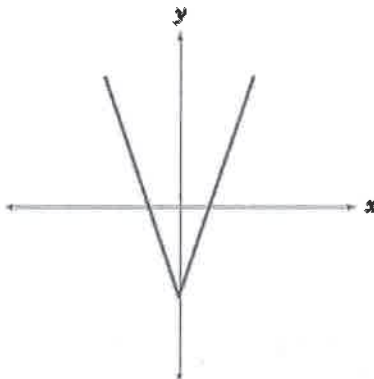
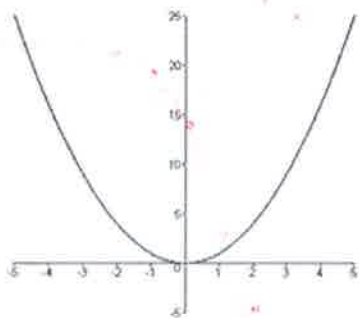
$[-4, 4]$

Range:

$[0, 3]$

Even Functions:

The following graphs are all **even** functions:

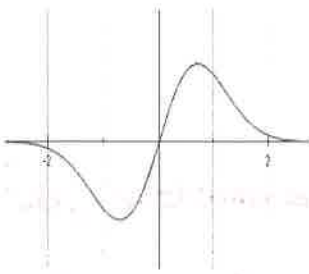


What do they all have in common?

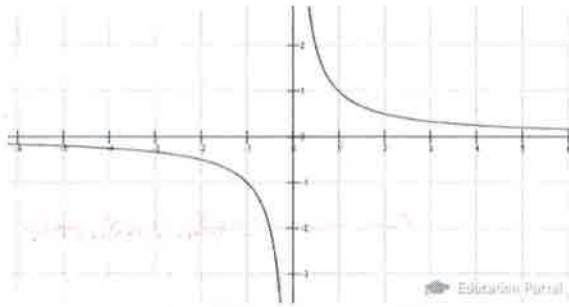
They're symmetric over the y-axis.

Odd Functions:

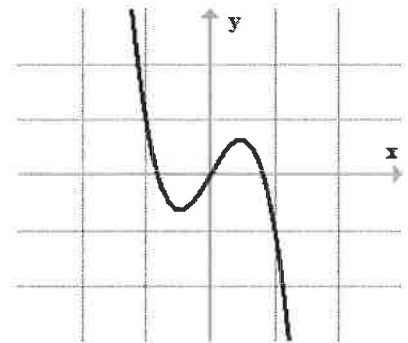
The following graphs are all **odd** functions:



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Education Portal



What do they all have in common?

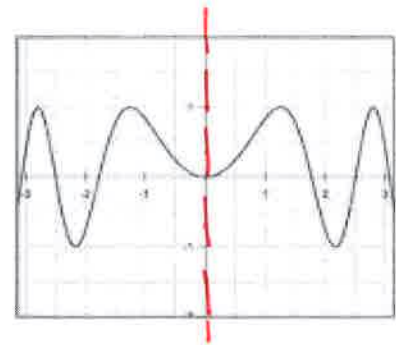
They are symmetric about the origin

• If you put a pin at the origin and rotated it 180°, there would be the same image.

Examples

1. Classify the function as even or odd, then draw in the line or point of symmetry.

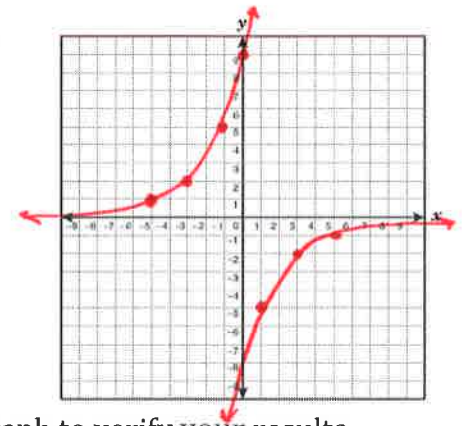
Even - Symmetric over the y-axis



2. Given that the function below is odd, complete the table. Use the graph to verify your results.

x	y
-5	1
-3	2
-1	5
0	9
1	-5
3	-2
5	-1

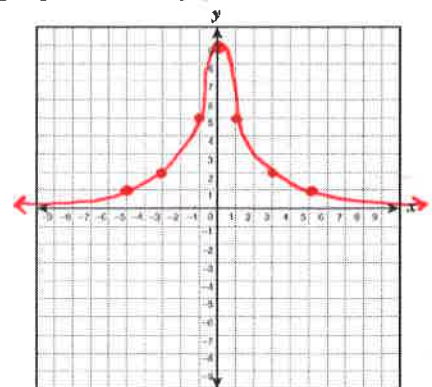
$$(x, y) \rightarrow (-x, -y)$$



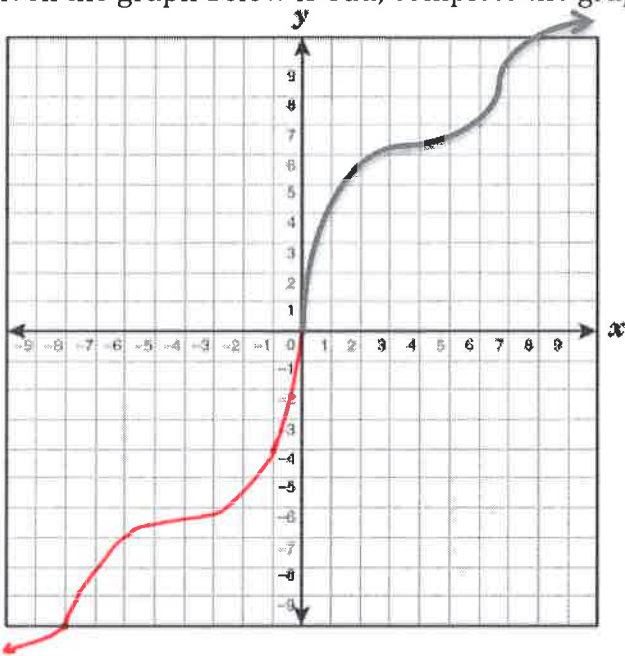
3. Given that the function below is even, complete the table. Use the graph to verify your results.

x	y
-5	1
-3	2
-1	5
0	9
1	5
3	2
5	1

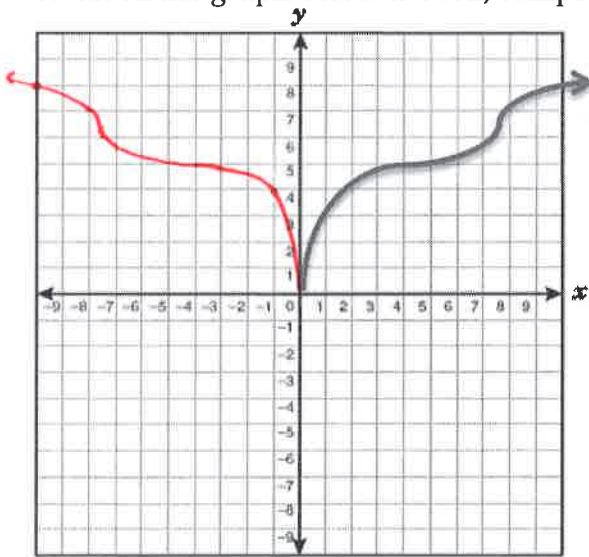
$$(x, y) \Rightarrow (-x, y)$$



4. Given the graph below is odd, complete the graph.



5. Given the graph below is even, complete the graph.



Reflection:

1. What is the difference between an even and an odd function?

Even functions have symmetry over the y-axis whereas odd functions are symmetric about the origin.

2. Is it possible for a function to be **both** even and odd?

Yes!

3. Does the degree of the polynomial indicate whether a function is even or odd?

No - we must do some analysis in order to make a decision.

