Parent Functions & Graph Symmetry

Essential Question:

How can I tell if a function is even or odd?

Parent Functions & Graph Symmetry

EQ: How can I tell if a function is even or odd?

EVEN functions

1. Definition: if f(−x) = f(x) , then f(x) is an even function

2. Graph:

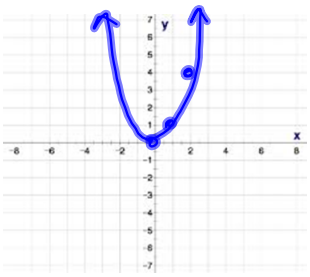
   a. The graph of an even function is symmetric about the y-axis.

   This means that both sides of the y− axis are mirror images of each other.

   b. If (a, b) is on the graph , so is (-a, b).

3. An example of an even function is $f(x)=x^2$

   a. Graph



   b. the points (2,4) and (-2 , 4) are on the graph

   c. f(−x)=f(x)

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ODD functions

1. Definition: if f(−x) = $-f(x)$, then f(x) is an odd function

2. Graph:

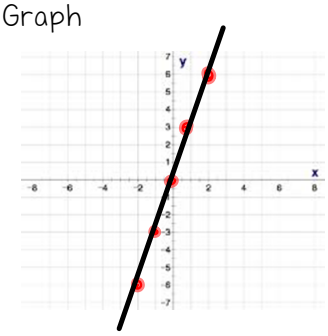
   a. The graph of an odd function is symmetric about the origin.

   This means that graph rotates around (0,0) (rotational symmetry)

   b. If (a, b) is on the graph , so is $(-a,-b)$.

3. An example of an odd function is f(x)=3x

   a. Graph



   b. the points (2,6) and (−2 , −6) are on the graph

   c. f(−x)= $-f(x)$

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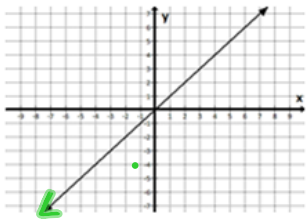
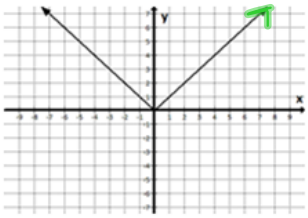
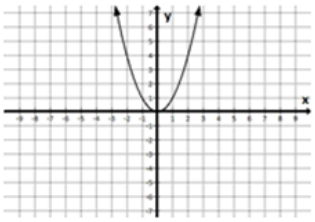
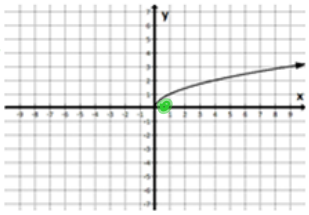
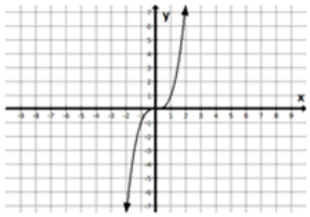
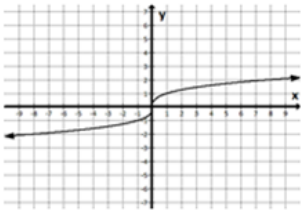
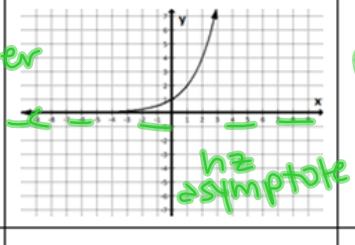
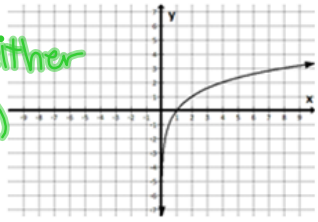
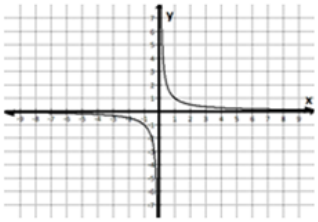
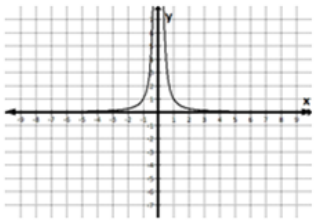
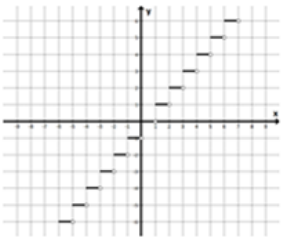
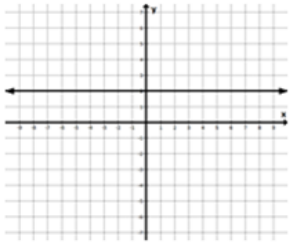
Parent Functions

Parent Function	Graph	Parent Function	Graph
$y = x$ Linear, odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty,\ y \to -\infty$ $x \to \infty,\ y \to \infty$		$y = \lvert x \rvert$ Absolute value, even Domain: $(-\infty, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to -\infty,\ y \to \infty$ $x \to \infty,\ y \to \infty$	
$y = x^2$ quadratic, even Domain: $(-\infty, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to -\infty,\ y \to \infty$ $x \to \infty,\ y \to \infty$		$y = \sqrt{x}$ square root, neither Domain: $[0, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to \infty,\ y \to \infty$	
$y = x^3$ cubic, odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty,\ y \to -\infty$ $x \to \infty,\ y \to \infty$		$y = \sqrt[3]{x}$ cube root, odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty,\ y \to -\infty$ $x \to \infty,\ y \to \infty$	
$y = b^x,\ b > 1$ exponential, neither Domain: $(-\infty, \infty)$ Range: $(0, \infty)$ End Behavior: $x \to -\infty,\ y \to 0$ $x \to \infty,\ y \to \infty$	 hz asymptote	$y = \log_b(x),\ b > 1$ logarithmic, neither Domain: $(0, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to 0^+,\ y \to -\infty$ $x \to \infty,\ y \to \infty$	
$y = \frac{1}{x}$ Domain: Range: End Behavior: $x \to -\infty,\ y \to$ $x \to \infty,\ y \to$		$y = \frac{1}{x^2}$ Domain: Range: End Behavior: $x \to -\infty,\ y \to$ $x \to \infty,\ y \to$	
$y = \text{int}(x) = [x]$ Greatest Integer, Neither Domain: $(-\infty, \infty)$ Range: $\{y : y \in \mathbb{Z}\}$ (integers) End Behavior: $x \to -\infty,\ y \to -\infty$ $x \to \infty,\ y \to \infty$		$y = C$ ($y = 2$ in the graph) Domain: Range: End Behavior: $x \to -\infty,\ y \to$ $x \to \infty,\ y \to$	

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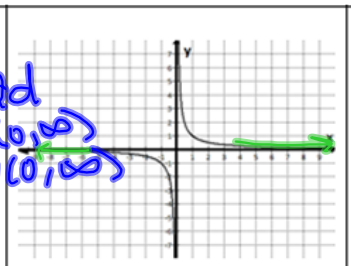
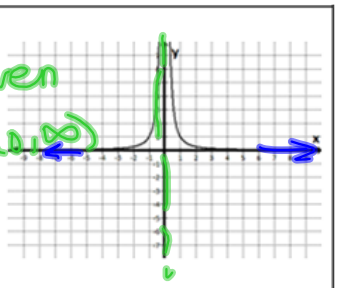
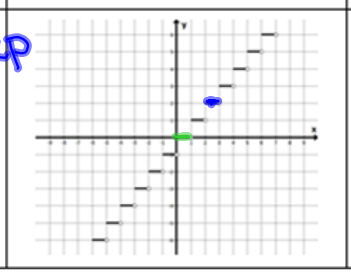
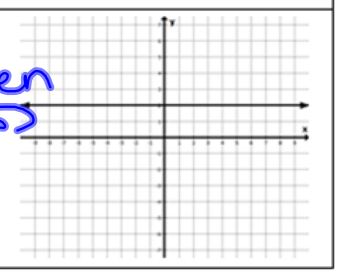
Try to fill out what you can on the remaining 3 parent functions!

$y=\frac{1}{x}$ Rational, odd Domain: $(-\infty,0)\cup(0,\infty)$ Range: $(-\infty,0)\cup(0,\infty)$ End Behavior: $x\to-\infty,\ y\to 0$ $x\to\infty,\ y\to 0$		$y=\frac{1}{x^2}$ Rational squared even Domain: $(-\infty,0)\cup(0,\infty)$ Range: $(0,\infty)$ End Behavior: $x\to-\infty,\ y\to 0$ $x\to\infty,\ y\to 0$	
$y=\text{int}(x)=[x]$ Greatest Integer, step Neither Domain: $(-\infty,\infty)$ Range: $\{y: y\in\mathbb{Z}\}$ (integers) End Behavior: $x\to-\infty,\ y\to-\infty$ $x\to\infty,\ y\to\infty$		$y=C$ ($y=2$ in the graph) constant, even Domain: $(-\infty,\infty)$ Range: $[2]$ End Behavior: $x\to-\infty,\ y\to 2$ $x\to\infty,\ y\to 2$	

Have out 1.3 Notes!


My weekend plans:
Z
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MINI
DONUT
CHEEZ BITS
Pusheen.com