College/Alg Trig  **2.2 Even and Odd Functions** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*We can classify the graphs of functions as either even, odd, or neither.*

|  |  |
| --- | --- |
| **Even** | **Odd** |
| A function is an even function if \_\_\_\_\_\_\_\_\_\_\_\_\_  for all x in the domain of f.  \*The right side of the equation of an even function does NOT change if x is replaced with –x.  Even functions are symmetric with respect to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means we could fold the graph on the axis, and it would line up perfectly on both sides! | A function is an odd function if \_\_\_\_\_\_\_\_\_\_\_\_\_\_  for all x in the domain of f.  \*Every term on the right side of the equation changes signs if x is replaced with –x.  Odd functions are symmetric with respect to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means we can flip the image upside down and it will appear exactly the same! |

**If we cannot classify a function as even or odd, then we call it neither!**

**Directions:** Determine graphically using possible symmetry, whether the following functions are even, odd, or neither.

|  |  |  |
| --- | --- | --- |
| 1.  [image] | 2.  [image] | 3.  [image] |
| 4.  [image] | 5.  [image] | 6.  [image] |

To verify algebraically if a function is even, odd, or neither, we must prove one of the following.

**For even prove: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ For odd prove: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**If neither of the above are true, we call the function neither!**

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| **Function Notation** | **What to do** | **Example.** |
|  | Repeat the original function. |  |
|  | Plug in a \_\_\_\_\_\_\_\_ for every x and simplify! |  |
|  | Change every sign you see in . If something starts positive, it changes to negative and if it starts negative, it changes to a positive. |  |

**Directions:** Verify algebraically whether each function is even, odd, or neither!

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| 1. |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |
| 8. |
| 9. |
| 10. |