Name_____

Hour_____

Enrichment: Even and Odd Functions

EVEN Function: ***f(-x) = f(x)***

- If you plug in (-x) it simplifies to the **original** function
- Symmetry to the Y-Axis: Folds over the Y-Axis

ODD Function: ***f(-x) = -f(x)***

- If you plug in (-x) it simplifies to the **opposite** of the original function
- Symmetric about the Origin: Rotates 180^o around the origin

NEITHER:

- *f(-x)* doesn't simplify to anything special related to *f(x)*
- Most functions are neither even nor odd

Directions:

a) Find *f(-x)* and simplify to prove whether each function is even, odd, or neither.
b) If the function is even or odd, state the symmetry. If neither, graph the function on your calculator and state whether or not it has line or rotational symmetry.

1. $f(x) = 3x^5 - 2x$

   a)

   b)

2. $g(x) = -2x^2 + 3x$

   a)

   b)

3. $h(x) = 4x^4 - 3$

   a)

   b)

4. $j(x) = \frac{3}{x}$

   a)

   b)

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

a)

b)

6. $l(x) = 6x^3 - \frac{2}{x}$

a)

b)

7. $m(x) = 3x - 5$

a)

b)

8. $n(x) = -3x^4 - x^2$

a)

b)

Patterns: Look back at the functions that were all even. Do their equations have anything in common? What about the functions that were all odd? Now look at the neithers.

- Do you see relationship between the equation and whether the function is even or odd?

- How can you tell if a function will be neither by looking at its equation?

- Write your own function equation that will be:
  Even Odd Neither