Name: _____ Date: _____ **Unit 6 Homework**

Even and Odd Polynomials Homework

Directions: Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable. ☺

IDENTIFY EACH FUNUCTION AS EVEN, ODD, OR NEITHER.
JUSTIFY YOUR ANSWERS COMPLETELY.

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

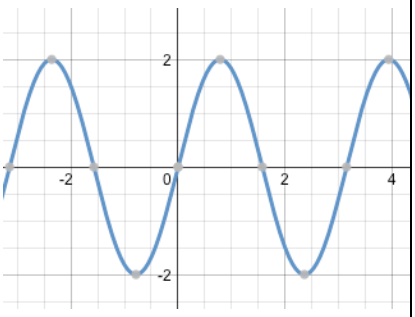
2. $d(x) = x^4 - 2x^2 + x^6$

3. $b(x) = 3x^7 - x$

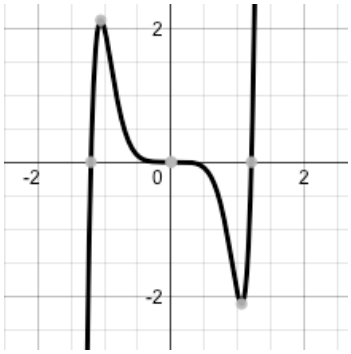
4. $h(x) = x^8 + 2x^2 + 2x$

5. **IDENTIFY EACH FUNUCTION AS EVEN, ODD, OR NEITHER. JUSTIFY YOUR ANSWER, AND PROVIDE AN EXAMPLE OR COUNTER-EXAMPLE TO SUPPORT EACH.**

a.

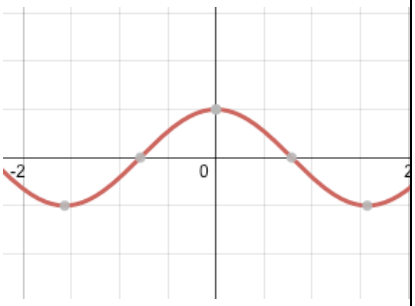


b.

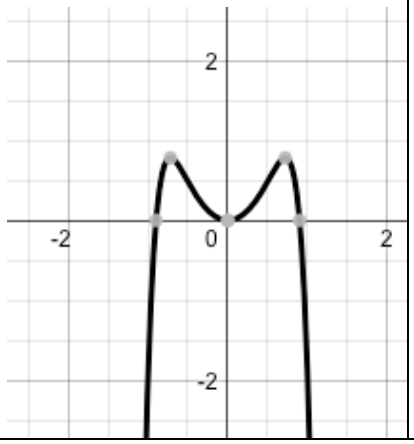


c.

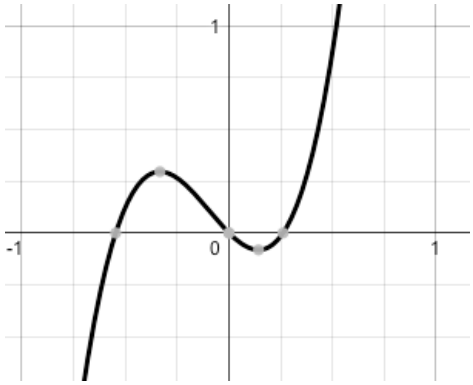
d.



e.



f.



Selected Solutions:

1. neither, since there is no equality between $f(x)$, $f(-x)$, or $-f(x)$:

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

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

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

3. odd, since $f(-x) = -f(x)$:

$f(-x) = 3(-x)^7 - (-x) = -3x^7 + x$

$-f(x) = -(3x^7 - x) = -3x^7 + x$

5. a. odd, symmetric about origin

c. neither, not symmetric about origin or the y-axis

e. even, symmetric about y-axis

a. example: $f(-1.5) = -2$ and $-f(1.5) = -2$, so $f(-x) = -f(x)$
c. example: $f(1) = 1$, but $f(-1) = 0$ and $-f(1) = -1$
e. example: $f(1.5) = .75$ and $f(-1.5) = .75$, so $f(x) = f(-x)$

Throwback: