**2017 SMM1 Week 10 Investigation**

**Read the following example:**

**Determine algebraically whether *f*(*x*) = –3*x*2 + 4 is even, odd, or neither.**

|  |  |  |
| --- | --- | --- |
| If I graph this, I will see that this is "[symmetric](http://www.purplemath.com/modules/symmetry.htm) about the *y*-axis"; in other words, whatever the graph is doing on one side of the *y*-axis is mirrored on the other side:    This mirroring about the axis is a hallmark of even functions.  Note also that all the exponents are even (the exponent on the constant term being zero: 4*x*0 = 4 ×1 = 4).  But the question asks me to make the determination *algebraically*, which means that I need to do it with algebra, not with graphs. |  | graph of –3x^2 + 4 |

So I'll plug –*x* in for *x*, and simplify:

*f*(–*x*) = –3(–*x*)2 + 4   
         = –3(*x*2) + 4   
         = –3*x*2 + 4

My final expression is the same thing I'd started with, which means that ***f*(*x*) is even**.

**Your task is to:**

1. Find definitions for the following words: odd functions and even functions

<http://www.mathsisfun.com/algebra/functions-odd-even.html>

2. Using the method in the example above determine algebraically whether *f*(*x*) = 2*x*3 – 10*x* is even, odd, or neither.

Include a sketch of the graph in your answer.