Worksheet 1.4A, Symmetries of functions
MATH 1410

1. Graph the functions below and decide if they are even, odd, or neither even nor odd.
   
   (a) \( f(x) = 3x^4 + 3 \)

   (b) \( f(x) = 2x^3 - x \)

   (c) \( f(x) = 2x^3 - x + 2 \)

   (d) \( f(x) = \frac{1}{x^2 + 1} \)

   (e) \( f(x) = \frac{x}{x^2 + 1} \)

2. You are given the graphs of certain functions. Determine if the function is even, odd, or neither.

   (a) [Graph]

   (b) [Graph]

   (c) [Graph]

   (d) [Graph]

3. Decide algebraically if the function is even, odd, or neither.
   
   (a) \( f(x) = x^3 - 4x \)

   (b) \( f(x) = \frac{x}{1 + x^2} \)

   (c) \( f(x) = x^5 + 7x^2 - 3x + 5 \)
4. Look carefully at the graphs of the following periodic functions and estimate their period.

(a) ![Graph A]
(b) ![Graph B]
(c) ![Graph C]
(d) ![Graph D]
(e) ![Graph E]

5. There is a function which is both even and odd! What is it?