Sample Mini-Exam 1C, MATH 1410
(Over lectures 1.1-1.6)
HUMANS ONLY! Calculators are NOT allowed.

There are 5 problems on 3 pages.

1. \( f(x) = x^2 + 5x + 8 \). Compute the “difference quotient” \( \frac{f(x + h) - f(x)}{h} \).

2. For each of the functions below, compute \( f(-x) \) and use your answer to determine if \( f(x) \) is an even function, an odd function or neither.
   
   (a) \( f(x) = \frac{100}{2x^3 + 6x} \).

   (b) \( f(x) = \frac{x}{x^4 - 16} \).
3. Suppose \( f(x) = x^2 - 25 \) and \( g(x) = x - 5 \). Compute

(a) \((f \circ g)(x)\)

(b) \((g \circ f)(x)\)

4. Suppose \( f \) is the function \( \{(3, 1), (4, 2), (5, 2), (6, 7)\} \) and \( g \) is the function \( \{(2, 12), (3, 16), (4, 5), (7, 3)\} \)

(a) \((f \circ g)(6)\)

(b) \((g \circ f)(4)\)

(c) \((f \circ g)(4)\)

(d) \((g \circ f)(7)\)
5. Compute, algebraically, the inverse of each of the following functions.

(a) \( h(x) = \sqrt{x^2 - 25} \)

(b) \( h(x) = 7(x - 4)^2 + 3 \)

(c) \( h(x) = \frac{2x + 3}{7} \)

(d) \( h(x) = \frac{1}{3x + 2} \)

(e) \( h(x) = \frac{7x}{x - 6} \)