

# 231 EXAM 1

You may use your notebook during the last 15 minutes of this exam.

You may NOT use calculators, cell phones, loose papers, or peeking.

Math 231  
September 17, 2013

Name: \_\_\_\_\_  
By printing my name I pledge to uphold the honor code.

- Determine if each of the following statements are true or false. For those that are true, *briefly* describe why they are true. For those that are false, provide an explicit counterexample.
  - For all real numbers  $x$ , there exists some  $y$  such that  $x < y$ .
  - For all real numbers  $x$ , there exists some  $y$  such that  $x = y^2$ .
- Sketch labeled graphs of  $f(x) = \frac{1}{x} - 2$  and  $g(x) = \frac{1}{x - 2}$  (and say which is which!).
- The solution to the inequality  $0 < |x + 5| < 0.25$  is:

A) $(-5.25, -5) \cup (-5, -4.75)$	C) $(-5.25, -4.75)$
B) $(-5.25, 0) \cup (0, 5.25)$	D) $(-5.25, 4.75)$
- The inverse of the function  $f(x) = 3 - 4x$  is:

A) $f^{-1}(x) = \frac{1}{3 + 4x}$	C) $f^{-1}(x) = \frac{x - 3}{-4}$
B) $f^{-1}(x) = \frac{1}{3 - 4x}$	D) $f^{-1}(x) = \frac{x}{-4} - 3$

5. Sketch a labeled graph of the function  $f(x) = |2 - 3x|$ , and then express  $f(x)$  algebraically as a piecewise-defined function that does not involve absolute values.

6. Find the domain of the function  $f(x) = \frac{\sqrt{x^2 - 4}}{x^2 - 9}$ . Show your work and put your final answer in interval notation with a box around it.

7. Prove that the sum of two odd integers is always even. Make sure that your argument is clear and uses mathematical notation and definitions.

sCRAP

I will not be grading anything on this page

TO CLEAR YOUR MIND YOU CAN COLOR IN ALL THE OPEN SPACES IN THESE WORDS