Name: _____

Math 1300-005 - Spring 2017

Quiz 5 - 2/17/17

On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work.

Signature: _____

Guidelines: You are permitted to use notes, the book, in-class worksheets/solutions, and your classmates on this quiz. Computers and graphing technology of any kind, including calculators, are not allowed (exceptions made for those who have an e-book). Please show all work and clearly denote your answer.

1. (a) Let $f(x) = x^2 - 3$ and $g(x) = 4x + 1$. Find $f'(x)$ and $g'(x)$.

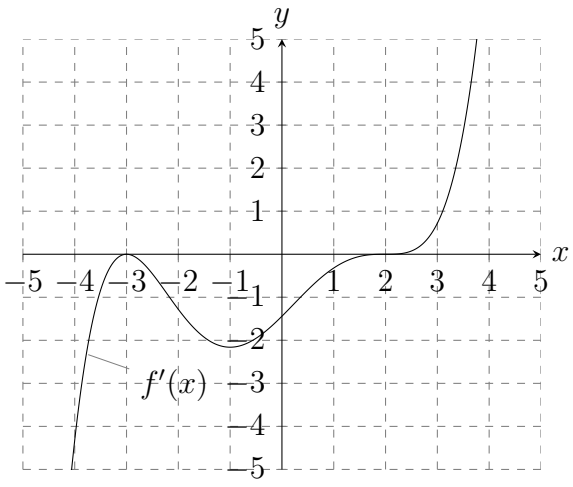
   (b) Based on part (a), what is $f'(x)g'(x)$?

   (c) Let $h(x) = (x^2 - 3)(4x + 1)$. What is $h'(x)$?

   (d) True or False? Please explain your answer.

$$\frac{d}{dx}\big(f(x)g(x)\big) = f'(x)g'(x)$$

2. Consider the graph of the *derivative* $f'(x)$ of a function $f(x)$. Answer the following questions.



(a) Construct sign charts for f' and f''. Be sure to label which is which!

(b) On what interval(s) is f increasing? On what interval(s) is f decreasing? State the location of any local maximums or local minimums, if they exist. Be sure to justify ALL of your answers here.

(c) On what interval(s) is f concave up? On what interval(s) is f concave down? State the location of any inflections points, if they exist. Be sure to justify ALL of your answers here.