Math 10A
Midterm Exam 1
October 28, 2014
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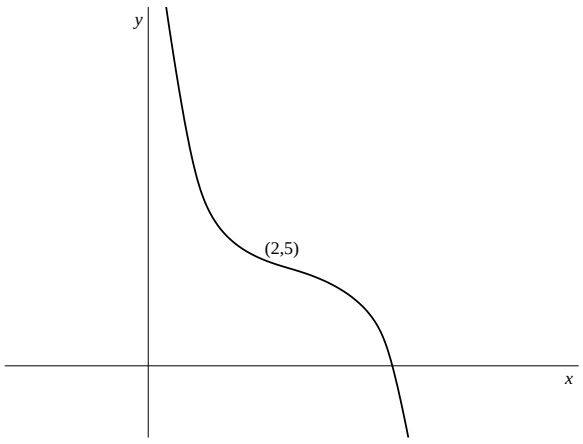
Version A

Instructions

1. **No calculators or other electronic devices are allowed during this exam.**
2. **You may use one page of notes, but no books or other assistance during this exam.**
3. **Write your *Name*, *PID*, and *Section* on the front of your Blue Book.**
4. **Write the *Version* of your exam at the top of the page on the front of your Blue Book.**
5. **Write your solutions clearly in your Blue Book**
   (a) **Carefully indicate the number and letter of each question and question part.**
   (b) **Present your answers in the same order they appear in the exam.**
   (c) **Start each question on a new side of a page.**
6. **Read each question carefully, and answer each question completely.**
7. **Show all of your work; no credit will be given for unsupported answers.**

0. (1 point) Carefully read and complete the instructions at the top of this exam sheet and any additional instructions written on the chalkboard during the exam.

1. (4 points) The graph of the function below is obtained by shifting the graph of $y = -x^3$ horizontally 2 units to the right and vertically 5 units up. Find a formula for the function.



Note: Problems 2 – 4 are on the other side of this page.

2. (4 points) Let $f(x) = \dfrac{x}{x+2}$ and $g(x) = x - 5$. Find:

   (a) $f\left(g\left(6\right)\right)$

   (b) $f\left(f\left(1\right)\right)$

   (c) $f\left(g^{-1}\left(5\right)\right)$

   (d) $f\left(g\left(x\right)\right)$

3. (8 points) Let $g(x) = 2\frac{x-2}{|x-2|}$.

   (a) Compute $\lim\limits_{x\to 0} g(x)$, $\lim\limits_{x\to 0^+} g(x)$, and $\lim\limits_{x\to 0^-} g(x)$, if they exist, or state why they don't exist.

   (b) Compute $\lim\limits_{x\to 2} g(x)$, $\lim\limits_{x\to 2^+} g(x)$, and $\lim\limits_{x\to 2^-} g(x)$, if they exist, or state why they don't exist.

   (c) Is $g(x)$ continuous on the interval $[-1, 1]$?

   (d) Is $g(x)$ continuous on the interval $[1, 3]$?

4. (a) (4 points) Find the number $L = \lim\limits_{h\to 0} \dfrac{\frac{5}{1+h} - 5}{h}$.

   (b) (2 points) Find a formula for the function $f(x)$ for which $f'(0) = L$.