Math 10A
Midterm Exam 2
July 26, 2012
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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 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 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.

1. (4 points) Let $g(x) = x^{1/5}$. Is $g(x)$ differentiable at $x = 0$? Hint: Use the definition of the derivative to investigate.

2. (16 points) Find the derivative of the following functions. No need to simplify.
   (a) $\dfrac{x^2 - 3}{4^x + 1}$
   (b) $e^{x^6} \cos x + \pi$
   (c) $\sqrt{2 \ln x + 10}$
   (d) $\arctan(3 - x) + \tan(2x)$

3. (12 points) Let $f(x) = \sin(x^2)$.
   (a) Is the graph of $f(x)$ increasing or decreasing at $x = \sqrt{\pi}$?
   (b) Is the graph of $f(x)$ concave up or concave down at $x = \sqrt{\pi}$?

4. (8 points) $x^2 y - 2y + 5 = 0$
   (a) Find $\dfrac{dy}{dx}$.
   (b) Find the equation of the line tangent to the curve at the point $(2, -\frac{5}{2})$.