

Math 10A.
Midterm Exam 2
November 15, 2012
Version A

Instructions:

1. You may use one page of notes, but you may not use any books or other assistance during this exam.
2. Write your *Name*, *PID*, and *Section* (for example A02) on the front of your Blue Book.
3. Write the *Version* of your exam on the front of your Blue Book.
4. Write your solutions clearly in your Blue Book
 - (a) Carefully indicate the number and letter of each question and each question part.
 - (b) Present your answers in the same order as they appear on the exam.
 - (c) Start each question on a new page (separate parts of the same question can be on the same page).
5. You may leave your answers in symbolic form, for example $\sqrt{42}$ or $\ln(6)$.
6. Show all of your work; no credit will be given for unsupported answers.
7. Write your solutions clearly and legibly; no credit will be given for illegible solutions.

Problems:

1. (9 points) Compute the derivative of the given function:

(a) $y = 20^x + x^{20}$

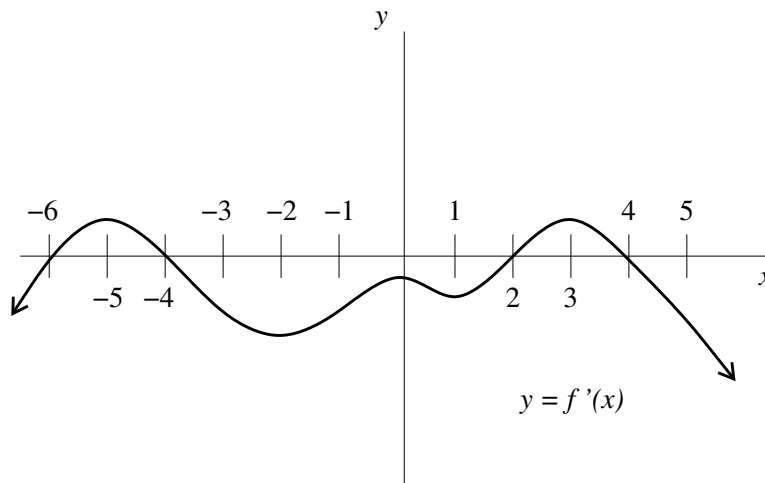
(b) $\left(\frac{1}{x^7} - \frac{5}{x^4}\right)6^x$

(c) $y = e^{\sqrt{2x^6+12}}$

2. (6 points) Let $g(x) = \frac{4x^2}{x+2}$.

- Find the equation of the tangent line to the graph of g at the point with x -coordinate 1.
- List the x -coordinates of all of the points on the graph of g at which the tangent line is horizontal.

3. (6 points) The graph of the **derivative** of a function f is given below.



- On which interval(s) is f increasing?
 - On which interval(s) is the graph of f concave down?
4. (9 points) Suppose that $P(t)$ is the population of Calculusville t years after 1950:
- What is the practical meaning of $P'(t)$? Please be sure to give the units of $P'(t)$ in your answer.
 - What would it mean if $P'(20)$ were a negative number?
 - What does $P'(30) = 0$ mean?