

Math 10A
Midterm Exam 1
July 12, 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. (6 points)
- (a) Find a solution to $e^{x+5} = 10^{2x}$.
 - (b) Find the amplitude and period of the function $p(x) = 3 + 2\cos(5x)$.
2. (18 points) Let $f(x) = x^2 + 5$ and $g(x) = \frac{1}{x-3}$.
- (a) What is the domain of $g(x)$?
 - (b) Find $g(f(x))$.
 - (c) Find $\lim_{x \rightarrow 3} f(x)$ or say it doesn't exist.
 - (d) Find $\lim_{x \rightarrow 3} g(x)$ or say it doesn't exist.
 - (e) Find $\lim_{x \rightarrow \infty} \frac{g(x)}{f(x)} = \lim_{x \rightarrow \infty} \frac{x-3}{x^2+5}$ or say it doesn't exist.
 - (f) Find the average rate of change of $f(x)$ over the interval $2 \leq x \leq 4$.

3. (8 points) Let $f(x) = 3x^2 + 12$.

(a) Find the derivative $f'(x)$ using the definition and algebra (do not use the power rule).

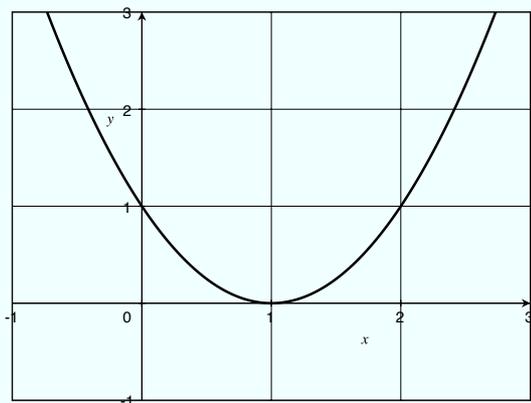
(b) Find $f'(1)$.

4. (4 points) The function $g(x)$ satisfies the following two conditions

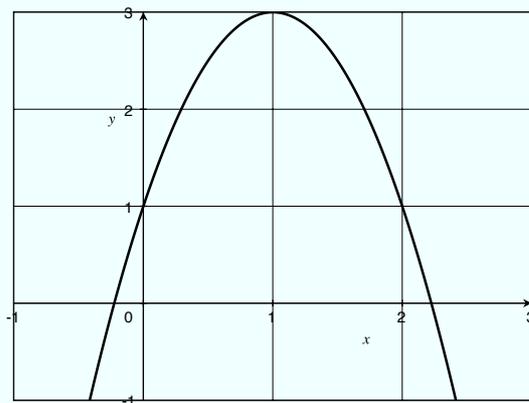
(i) $g(1) = 0$, and

(ii) $\lim_{x \rightarrow 1} \frac{g(x) - g(1)}{x - 1} = 3$.

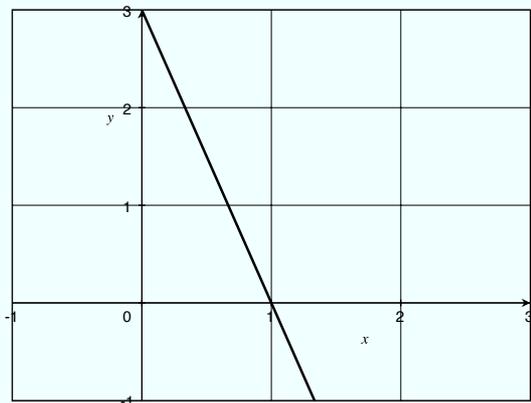
Which of the following is a possible graph of $g(x)$? Clearly write the letter corresponding to your choice in your Blue Book. You do not need to justify your answer.



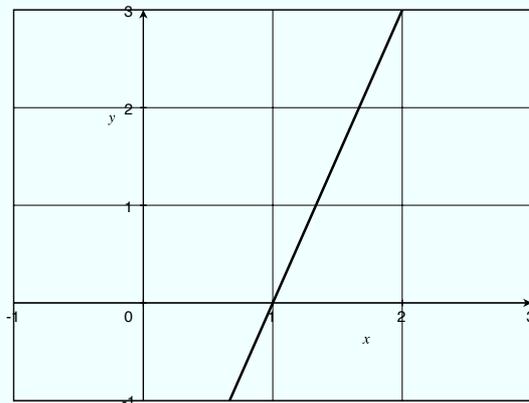
(A)



(B)



(C)



(D)