

TEST #1

Max = 15

Name: _____

Student Number: _____

Circle the DGD which you attend (this is where you will pick up your graded midterm):

Nazanin	Nicole	Mona	Alex	Mona
10:00 (DGD1)	11:30 (DGD2)	13:00 (DGD3)	14:30 (DGD4)	16:00 (DGD5)
MRT 211	SMD 330	FTX 137	MRT 219	SMD 226

- Time: 80 min.
- No calculators are permitted.
- There are 5 multiple choice questions worth 1 mark each and 3 problems worth 10 marks.
- For the multiple choice questions, circle the letter of your choice.
- Work all problems in the space provided. Use the backs of the pages for rough work if necessary. Do not use any other paper.
- Problems require complete and clearly presented solutions and carry part marks if there is substantial correct work toward the solution.
- Cellular phones, unauthorized electronic devices or course notes are not allowed during this exam. Phones and devices must be turned off and put away in your bag. Do not keep them in your possession, such as in your pockets. If caught with such a device or document, the following may occur: you will be asked to leave immediately the exam, academic fraud allegations will be filed which may result in you obtaining a 0 (zero) for the exam. By signing below, you acknowledge that you have ensured that you are complying with the above statement.

Signature: _____

1. [1 point] What is the domain of the function $f(x) = \sqrt{4 - x^2}$?

- (A) $x \geq 2$ (B) $-2 \leq x \leq 2$ (C) $x \leq -2$
(D) $x < 2$ (E) all x (F) $x \leq -2$ or $x \geq 2$

2. [1 point] Find a formula for the inverse of $f(x) = \ln(x + 6)$.

- (A) e^{x+6} (B) $e^x + 6$ (C) $e^x - 6$
(D) $x + 6$ (E) e^{x-6} (F) $6 - e^x$

3. [1 point] What is the equation of the tangent line to the curve $y = f(x) = 2x + 3x^2$ at the point $(1, 5)$?

- (A) $y = 32x - 27$ (B) $y = 6x - 1$ (C) $y = 8x - 3$
(D) $y = 3x + 2$ (E) $y = 2x + 3$ (F) $y = 2x + 3x^2$

4. [1 point] If a function $f(x)$ is continuous at $x = a$, then it must be differentiable there.

- (A) TRUE (B) FALSE

5. [1 point] What is $\lim_{x \rightarrow \infty} \frac{5x^3 + 7x^2 - 8x + 9}{11x^2 + 7x - 6}$?

- (A) $3/2$ (B) 0 (C) ∞ (D) $-\infty$ (E) $5/11$ (F) $11/5$

6. [2 points] Find the limit $\lim_{x \rightarrow 2} \frac{\sqrt{x^2 + 12} - 4}{x - 2}$. You must do this properly, showing all steps.

7. [3 points] Use the definition of the derivative to find $f'(x)$ if $f(x) = \frac{2x^2}{x + 3}$. Then verify your answer with the Quotient Rule.

8. [5 points] Find the first derivatives of the following functions.

(a) $f(x) = e^{-3x} \sin(4x^2)$

(b) $g(t) = \sqrt{3t^2 + 7t - 2}$

(c) $\varphi(\theta) = \tan^2(3e^\theta)$

(d) $p(t) = 5^{\sqrt{t}}$

(e) $y = e^{x \cos(2x)}$