



Department of Mathematical Sciences

MIDTERM EXAM

MATH 105 Calculus I

Date: *October 20, 2014*

7:00 – 8:00 pm

ID No: _____

Attendance number:-----

Name: _____

Section

Instructor	Male Section	Instructor	Female Section
Viktor Bovdi	01	Viktor Bovdi	51
Fathi Allan	02	Philippe Poulin	52
Philippe Poulin	03	M. Bachraoui	53
		K. Abdukhalikov	54
		Viktor Bovdi	55
		Abdelrahim	56
		Viktor Bovdi	57
		Naim Markos	58

Instructions:

- 1. Exam duration is 60 minutes**
2. The exam consists of 5 pages including this page
3. Read the questions carefully and identify clearly what is given and what you need to find.
4. Show all your work to get full credit.
5. Organize well your work and submit a clean copy.
6. Only scientific calculators are allowed. No programmable or graphic calculators are allowed.
7. Keep your mobile off and visible to the proctor.

Questions	Points
1	/12
2	/4
3	/10
4	/9
5	/5
Total	/40

Q(1) (3 points each) Evaluate the following limits if they exist:

(a) $\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x - 2}$

(b) $\lim_{x \rightarrow 3^-} \frac{x - 3}{|x - 3|}$

(c) If $2 - x^2 \leq f(x) \leq 2 + x^2$, then find $\lim_{x \rightarrow 0} f(x)$

(d) $\lim_{x \rightarrow 0} \frac{\tan(3x)}{5x}$

Q(2) (4 points) Find the horizontal asymptotes of the function $f(x) = \frac{x^2 - x + 5}{\sqrt{x^4 + 3}}$

Q(3) (5 points each) a) Find the values of the constant A so that the function f(x) is continuous at $x = 1$

$$f(x) = \begin{cases} Ax^2 + 3x - 1, & \text{for } x \geq 1 \\ 4x - A, & \text{for } x < 1 \end{cases}$$

b) Use the definition to find the derivative of the function $f(x) = \sqrt{x^2 + x + 3}$ at $x = 0$

Q(4) (3 points each) Find $\frac{dy}{dx}$ (Do not simplify)

a) $y = \frac{\sqrt{x}-x+1}{x^3-x-2}$

b) $y = \tan(\sin(3x))$

c) $y = \sin^{-1}(e^{3x} + 3) + \sin\left(\frac{\pi}{3}\right)$

Q(5) (5 points) Find the equation of the line tangent to the curve $y^3 + xy - x^2 - 1 = 0$ at the point (0,1)