



COURSE DETAILS:

ORIENTATION MATHEMATICS II		MATH 002	MAJOR EXAM II	A
Semester:	Spring Semester --Term 172			
Date:	Wednesday April 11, 2018			
Time Allowed:	90 minutes			

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	
Instructor's Name:	

INSTRUCTIONS:

- You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.
- NO talking or looking around during the examination.
- NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.
- Show all your work and be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.

GRADING:

	Page 1	Page 2	Page 3	Page 4	Page 5	Page 6	Total	Total
Questions								
Marks	10	10	21	16	15	8	80	20

Q.1 (20 points) Choose the correct answer

- 1) Find all the solutions of $\cos x(\cos x + 1) = 0$ on $[0, 2\pi)$
- A) π
B) π and $\frac{\pi}{2}$
C) 0 and π
D) π , $\frac{\pi}{2}$ and $\frac{3\pi}{2}$
- 2) The following system of two linear equations: $8x - 9y = 10$
 $-24x + 27y = 13$ is:
- A) Consistent with infinitely many solutions
B) Inconsistent with one solution
C) Consistent with exactly one solution
D) Inconsistent with no solution
- 3) If $\sin^{-1}(\sin(x)) = x$, then x belongs to:
- A) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
B) $[-1, 1]$
C) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$
D) $[0, \pi]$
- 4) $\sec^{-1}(-\sqrt{51})$ rounded to two decimal places is:
- A) 1.71
B) -1.71
C) 1.53
D) not defined.
- 5) Determine the period of the following function. $y = 3\sin\left(\frac{x}{4} - \frac{\pi}{2}\right)$
- A) $\frac{\pi}{8}$
B) 8π
C) 2π
D) 3

You must write the correct answer to each question in the box below

Question	1	2	3	4	5
Answer					

6) $\cos^{-1}\left(\cos\left(\frac{7\pi}{6}\right)\right) =$

A) $\frac{\pi}{6}$

B) $\frac{5\pi}{6}$

C) $\frac{7\pi}{6}$

D) $\frac{11\pi}{6}$

7) $\cos(\pi - \theta) =$

A) $\sin \theta$

B) $\cos \theta$

C) $-\sin \theta$

D) $-\cos \theta$

8) The graph of $y = 5\sin \pi x$ in the interval $[0, 4]$ has the following x -intercepts:

A) $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2}$

B) $0, 1, 2$

C) $0, 1, 2, 3, 4$

D) $0, 2, 4$

9) Find the **range** for the function: $y = -2\sin(2x - \pi) + 3$

A) $[-2, 2]$

B) $[1, 5]$

C) $[-2, 3]$

D) $[-3, 3]$

10) Which of the following is an identity?

A) $\csc x = \sin x \cos x$

B) $\csc x = \cos x \cot x$

(C) $\frac{1}{\csc x} = \cos x \cot x$

(D) $\frac{1}{\csc x} = \cos x \tan x$

You must write the correct answer to each question in the box below

Question	6	7	8	9	10
Answer					

Q.2 (5 points): Write $\sin\left[\tan^{-1}\left(\frac{x}{9}\right)\right]$ as an algebraic expression. Assume that x is positive and in the domain of the given function.

Q.3 (8 points): Given $\cot \alpha = -\frac{3}{2}$, α is in Quadrant *II* and $\sec \beta = 5$, β is in quadrant *IV*.
Find $\cos(\alpha - \beta)$

Q.4 (8 points) : Determine the **amplitude, period, and phase shift** of $y = -3\cos\left(\frac{\pi}{2}x + 2\pi\right)$ then **graph** the function for **one period**.

Q.5 (8 points) : Verify the identity. **Show all your steps**

a) $(\sec x - \tan x)^2 = \frac{1 - \sin x}{1 + \sin x}$

b) $\frac{\csc \theta - \cot \theta}{\sec \theta - 1} = \cot \theta$

Q.6 (8 points): Solve the following equations on the interval $[0, 2\pi)$.

a) $\cos x \cdot \csc x = 2 \cos x$

b) $4 \cos^2(2x) - 1 = 0$

Q.7 (6 points) : Solve the following system of linear equations using Addition/Elimination Method.

(Write the solution Set, if any)

SHOW ALL YOUR STEPS

$$2x + 3y - z = 1$$

$$x + 2y = 3$$

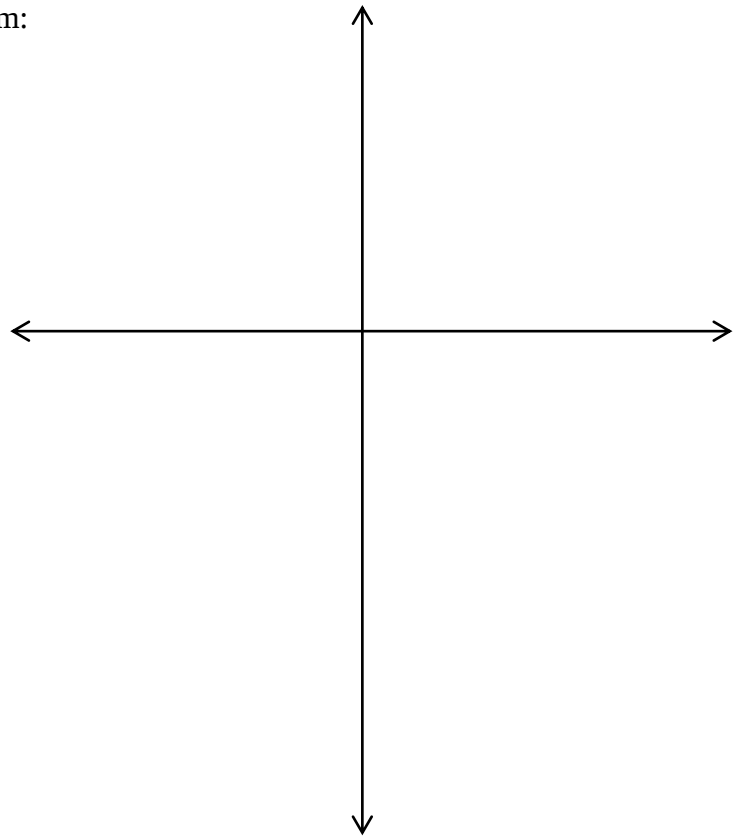
$$x + 3y + z = 4$$

Q.8 (9 points) : Graph the solution set of the system:

$$x + y \leq 3$$

$$x - y > -3$$

$$x^2 + y^2 < 9$$



Q.9 (8 points) : Use **Gaussian** Elimination with back substitution or **Gauss-Jordan** to solve the following system of linear equations and **write the solution set, if any.**

$$x + 3y + 5z = 20$$

$$2x + 3y + 4z = 16$$

$$x + 2y + 3z = 12$$