



COURSE DETAILS:

ORIENTATION MATHEMATICS II		MATH 002	FINAL EXAM	A
Semester:	FALL Semester --Term 181			
Date:	Saturday December 15, 2018 (4:00 P.M.)			
Time Allowed:	120 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	Total	Total
Questions							
Marks	10	10	21	17	22	80	40

Q.1 (20 points)A Choose the correct answer

1) The phase shift of $y = \frac{1}{2} \cos(4x + \pi)$ is:

- A) $\frac{-4}{\pi}$
- B) $\frac{\pi}{4}$
- C) $\frac{-\pi}{4}$
- D) -4π

2) If $\sin x = -\frac{\sqrt{5}}{3}$ and $\cos x = -\frac{2}{3}$, then $\cot x =$

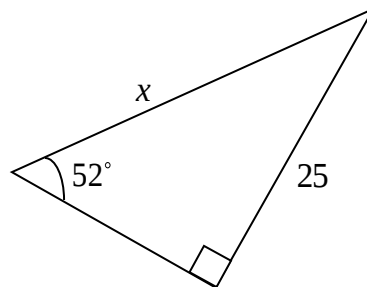
- A) $-\frac{\sqrt{5}}{2}$
- B) $\frac{2}{\sqrt{5}}$
- C) $\frac{\sqrt{5}}{2}$
- D) $-\frac{2}{\sqrt{5}}$

3) $\sec x \cdot \sin x =$

- A) $\csc x$
- B) $\cot x$
- C) $\cos x$
- D) $\tan x$

4) Find the side labeled x

- A) 40.98
- B) 40.61
- C) 19.53
- D) 31.73



5) Find the vertex and directrix of the parabola $(y+8)^2 = -32x+32$

- A) Vertex $(1, -8)$, directrix $x = 9$
- B) Vertex $(-8, 1)$, directrix $x = -32$
- C) Vertex $(1, -8)$, directrix $y = 9$
- D) Vertex $(-1, 8)$, directrix $y = 9$

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

Question	1	2	3	4	5
Answer					

6) Solve $\begin{bmatrix} 2 & x \\ 6 & 0 \end{bmatrix} \begin{bmatrix} y & 3 \\ -2 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 3 \\ -6 & 18 \end{bmatrix}$ for x and y .

- A) $x = \frac{3}{2}, y = -\frac{3}{2}$
 B) $x = -\frac{3}{2}, y = -1$
 C) $x = -2, y = -1$
 D) $x = -\frac{3}{2}, y = -2$

7) Find the domain of the function. $h(x) = \ln(x^2 - 9)$

- A) $(-\infty, -9) \cup (9, \infty)$
 B) $(-3, 3)$
 C) $(-\infty, -3) \cup (3, \infty)$
 D) $(-\infty, \infty)$

8) Expand the logarithmic expression. $\log\left(\frac{x^3}{\sqrt{y}(x-2)^6}\right)$

- A) $\frac{1}{3}\log x - \frac{1}{2}\log y - 6\log(x-2)$
 B) $3\log x - \frac{1}{2}\log y + 6\log(x-2)$
 C) $3\log x - 2\log y - 6\log(x-2)$
 D) $3\log x - \frac{1}{2}\log y - 6\log(x-2)$

9) Find the complete solution of the system.
$$\begin{cases} x + y + z = 2 \\ 2x - 3y + 2z = 4 \\ 4x + y - 3z = 1 \end{cases}$$

- A) $(1, 0, 1)$
 B) $(5, 0, 1)$
 C) $(0, 1, -1)$
 D) $(0, -2, 2)$

10) Which point is a solution to the inequality: $y \leq 3x - 1$?

- A) $(0, 0)$
 B) $(2, 5)$
 C) $(-1, 1)$
 D) $(-2, 0)$

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

Question	6	7	8	9	10
Answer					

Q.2 (5 points) Use a sketch to write the following expression as an algebraic expression.

Assume that x is positive. $\cot\left[\sin^{-1}\left(\frac{x}{\sqrt{x^2+4}}\right)\right]$

Q.3 (6 points) Suppose that $\sin\alpha = \frac{4}{5}$, α is in quadrant II and $\cos\beta = \frac{1}{2}$, β is in quadrant IV . Find the exact value of $\cos(\alpha + \beta)$

Q.4 (6 points) Solve the trigonometric equation: $5\sin(x) = 3\sin(x) + \sqrt{3}$, $0 \leq x < 2\pi$

Q.5 (4 points) Use an addition or subtraction formula to find the exact value of the expression: $\cos(195^\circ)$

Q.6 (10 points) Use Gauss-Jordan to solve the system:
$$\begin{cases} x + 3y + 6z = -2 \\ y - 3z = 7 \\ 2x + 4y + 10z = -2 \end{cases}$$

Q.7 (7 points) Use Cramer's Rule to find the value of x only:
$$\begin{cases} x + 2y - z = 3 \\ x + 2z = 1. \\ 2x - y + 4z = 1 \end{cases}$$

Don't find the values of y and z .

Q.8 (4 points) Let $\begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}$ be the inverse of the coefficient matrix of $\begin{cases} x - y + z = 8 \\ 2y - z = -7 \\ 2x + 3y = 1 \end{cases}$.

Solve the system of equations.

Q.9 (6 points) Find the standard form of the equation of an ellipse with a vertical major axis of length 18, and a minor axis of length $2\sqrt{7}$, and center at $(-1, 3)$.

Q.10 (12 points) For the conic section: $9y^2 - 4x^2 - 18y + 24x - 63 = 0$, find the coordinates of the center, vertices and foci. **Then sketch the graph.**

