Prince Sultan University

Deanship of Educational Services

Department of Mathematics and General Sciences

COURSE DETAILS:

ORIENTATION MATHEMATICS II	MATH 002	FINAL EXAM A
Semester:	Spring Semester --Term 182	
Date:	Saturday April 20, 2019 (4:00 P.M.)	
Time Allowed:	180 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**	**20**	**20**	**18**	**22**	**100**	**40**

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

1) Find the length of the major axis of: $\frac{x^2}{4}+\frac{y^2}{9}=1$

A) 13
B) 6
C) 4
D) 9

2) The Equation of the parabola with vertex $(-1,3)$ and directrix $x=-4$ is:

A) $(x+1)^2=12(y-3)$

B) $(y-3)^2=12(x+1)$

C) $(y-3)^2=28(x+1)$

D) $(x+1)^2=-12(y-3)$

3) Find the **range** of the function $f(x)=e^{-x+3}+5$.

A) $(3,\infty)$

B) $(-\infty,5)$

C) $(-\infty,3)$

D) $(5,\infty)$

4) The expression $3\log_2(3)+\log_2(5)-\log_2(9)$ is equivalent to:

A) $3\log_2(-1)$

B) $3\log_2\left(\frac{15}{9}\right)$

C) $\log_2(5)$

D) $\log_2(15)$

5) The equation of the ellipse in standard form with vertices: $(-8,0),(8,0)$, and foci: $(-5,0),(5,0)$ is:

A) $\frac{x^2}{64}+\frac{y^2}{39}=1$

B) $\frac{x^2}{25}+\frac{y^2}{39}=1$

C) $\frac{x^2}{25}+\frac{y^2}{64}=1$

D) $\frac{x^2}{39}+\frac{y^2}{64}=1$

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

Question	**1**	**2**	**3**	**4**	**5**
Answer					

6)A The **horizontal phase shift** of the function $y=-3\cos\left(\frac{\pi}{2}x+2\pi\right)$ is:

A) 4 units to the left
B) 4 units to the right
C) 2 units to the left
D) 2 units to the right

7) Solve the equation: $\cos(2x)=\frac{\sqrt{2}}{2}$ for x in $[0,2\pi)$

A) $0,\frac{2\pi}{3},\pi,\frac{4\pi}{3}$
B) $\frac{\pi}{4},\frac{3\pi}{4},\frac{5\pi}{4},\frac{7\pi}{4}$
C) $\frac{\pi}{8},\frac{7\pi}{8},\frac{9\pi}{8},\frac{15\pi}{8}$
D) $\frac{\pi}{6},\frac{11\pi}{6},\frac{13\pi}{6},\frac{23\pi}{6}$

8) For what value of b is $\sin(b+x)=\cos(x)$

A) $-\frac{\pi}{2}$
B) $\frac{\pi}{2}$
C) π
D) 2π

9) Solve the equation: $3\log(4x-30)=3$

A) $x=10$
B) $x=\frac{31}{4}$
C) $x=\frac{33}{4}$
D) $x=1$

10) The equation $x^2+2x-y^2-4y+9=0$ is for:

A) Circle
B) Parabola
C) Hyperbola
D) Ellipse

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

Question	**6**	**7**	**8**	**9**	**10**
Answer					

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COURSE DETAILS:

ORIENTATION MATHEMATICS II	MATH 002	FINAL EXAM B
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Date:	Saturday April 20, 2019 (4:00 P.M.)	
Time Allowed:	180 minutes	

STUDENT DETAILS:

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GRADING:

	Page 1	Page 2	Page 3	Page 4	Page 5	Page 6	Total	Total
Questions								
Marks	**10**	**10**	**20**	**20**	**18**	**22**	**100**	**40**

Q.1B (20 points) **Choose the correct answer**

1) Solve the equation: $3\log(4x-30)=3$

A) $x=1$

B) $x=\frac{33}{4}$

C) $x=10$

D) $x=\frac{31}{4}$

2) The **horizontal phase shift** of the function $y=-3\cos\left(\frac{\pi}{2}x+2\pi\right)$ is:

A) 4 units to the right
B) 2 units to the left
C) 2 units to the right
D) 4 units to the left

3) For what value of b is $\sin(b+x)=\cos(x)$

A) $\frac{\pi}{2}$

B) 2π

C) $-\frac{\pi}{2}$

D) π

4) Solve the equation: $\cos(2x)=\frac{\sqrt{2}}{2}$ for x in $[0,2\pi)$

A) $\frac{\pi}{8},\frac{7\pi}{8},\frac{9\pi}{8},\frac{15\pi}{8}$

B) $0,\frac{2\pi}{3},\pi,\frac{4\pi}{3}$

C) $\frac{\pi}{6},\frac{11\pi}{6},\frac{13\pi}{6},\frac{23\pi}{6}$

D) $\frac{\pi}{4},\frac{3\pi}{4},\frac{5\pi}{4},\frac{7\pi}{4}$

5) The equation $x^2+2x-y^2-4y+9=0$ is for:

A) Ellipse
B) Hyperbola
C) Parabola
D) Circle

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

Question	**1**	**2**	**3**	**4**	**5**
Answer					

6)B The expression $3\log_2(3)+\log_2(5)-\log_2(9)$ is equivalent to:

A) $\log_2(5)$

B) $\log_2(15)$

C) $3\log_2(-1)$

D) $3\log_2\left(\frac{15}{9}\right)$

7) The Equation of the parabola with vertex $(-1,3)$ and directrix $x=-4$ is:

A) $(x+1)^2=-12(y-3)$

B) $(y-3)^2=28(x+1)$

C) $(x+1)^2=12(y-3)$

D) $(y-3)^2=12(x+1)$

8) Find the length of the major axis of: $\frac{x^2}{4}+\frac{y^2}{9}=1$

A) 4

B) 9

C) 6

D) 13

9) Find the **range** of the function $f(x)=e^{-x+3}+5$.

A) $(-\infty,5)$

B) $(3,\infty)$

C) $(5,\infty)$

D) $(-\infty,3)$

10) The equation of the ellipse in standard form with vertices: $(-8,0),(8,0)$, and foci: $(-5,0),(5,0)$ is:

A) $\frac{x^2}{25}+\frac{y^2}{64}=1$

B) $\frac{x^2}{64}+\frac{y^2}{39}=1$

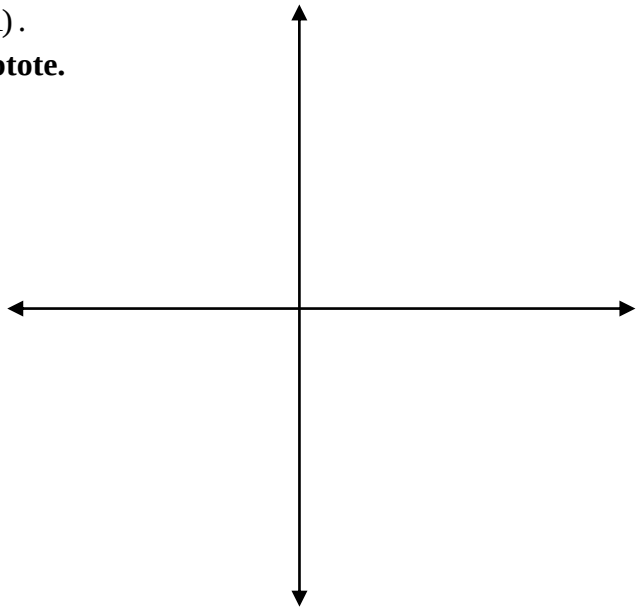
C) $\frac{x^2}{39}+\frac{y^2}{64}=1$

D) $\frac{x^2}{25}+\frac{y^2}{39}=1$

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

Question	**6**	**7**	**8**	**9**	**10**
Answer					

Q.2 (6 points) **Sketch the graph** of $f(x) = 3 - \log_2(x-1)$.
Give the **Domain, Range**, and **the equation of the asymptote.**



Q.3 (5 points) **Solve** the equation: $5e^{2x-1} + 7 = 27$

Show all your steps

Q.4 (4+5 points) **Solve** the equation:

a) $3\tan(x).\sin(x) - 2\tan(x) = 0$; $0 \le x < 360^\circ$

b) $\sin^2(x) = 4 - 5\cos^2(x)$; $x \in [0, 2\pi)$

Q.5 (6 points) **Verify** the identity

a) $1-\dfrac{\sin^2\theta}{1+\cos\theta}=\cos\theta$

b) $\dfrac{\sin x+\tan x}{\tan x}=1+\cos x$

Q.6 (6 points) Let $\tan\theta=-\dfrac{2}{5}$ and $\cos\theta<0$. Find the exact value of **the remaining trigonometric functions** of θ.

Q.7 (8 points) Solve the matrix equation: $A.X+5I_2=A.B$ for X given that:

$A=\begin{bmatrix}2 & 1\\ 7 & 4\end{bmatrix}$ and $B=\begin{bmatrix}-4 & 5\\ 2 & -3\end{bmatrix}$.

Q.8 (4+2+4 points) If $A=\begin{bmatrix} 1 & 0 & 3 \\ 0 & 2 & 5 \\ -2 & 1 & -7 \end{bmatrix}$

a) Find the **determinant** of A .

b) Does matrix A have an inverse? **Give the reason**.

c) Use Cramer's Rule to solve the system of equations for x **only**: $\begin{cases} -2y+z=2 \\ -2x-3y=0 \\ x-y+z=1 \end{cases}$

Q.9 (8 points) Solve the following system of equations using the **inverse of the coefficient matrix,** A^{-1} **(Write the solution set, if any)**

$x-y=7$

$3x+2z=-2$

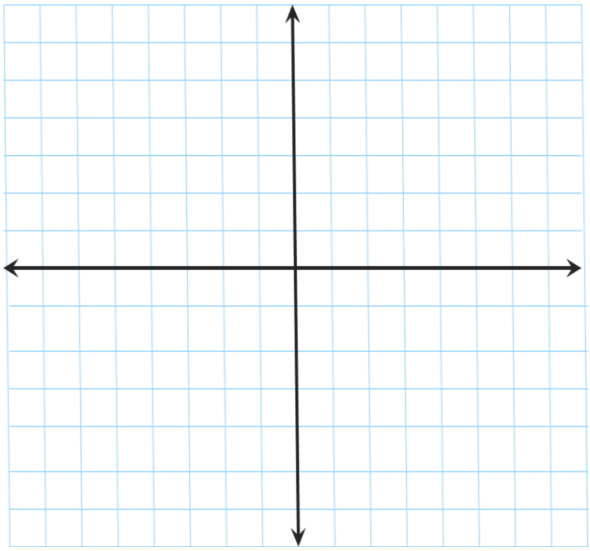
$-x-z=4$

Q.10 (6 points) Find the **coordinates of the vertex and the focus** and the **equation of the directrix.**

$y^2 - 6y + 8x - 31 = 0$

Q.11 (10 points) Consider the equation, $\frac{(y-3)^2}{4} - \frac{(x+1)^2}{16} = 1.$

a) Find the coordinates of the **center, the foci**, and the **vertices**



b) **Graph** the equation.

c) Give the **equations of the asymptotes**.

Q.12 (6 points) Find the standard form of the equation of the ellipse with the vertices at $(-3,-2)$, $(9,-2)$ and a minor axis of length 6.