Prince Sultan University
Department of Mathematics & General Sciences

MATH 002 Major Exam II
Semester 1, Term 171
Tuesday December 5th, 2017

Time allowed: 90 minutes

Student Name: _____ Student ID number:_____

Section: _____ Instructor's Name: _____

1. You may use a scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. There should be NO talking during the examination.
5. If your mobile phone is seen or heard, your exam will be taken immediately.
6. You must show all your work beside the problem. Be organized.
7. You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
8. This examination has 9 problems. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1-4	22	
5-6	16	
7-8	14	
9	8	
Total	**60**	
Total	**20**	

Q1. [8 pts] Find the amplitude, period and phase shift of the function $y = -2\cos\left(x - \pi/2\right)$. Then sketch one period of the graph.

Q2. [6 pts] Find the exact value of $\cot\left[\sin^{-1}\left(-\frac{5}{9}\right)\right]$. **Show all your steps.**

Q3. [4 pts] Verify the trig identity $\frac{\cos x \sec x}{\cot x} = \tan x$

Q4. [4 pts] Verify the trig identity $\frac{\sin x}{\cos x + 1} + \frac{\cos x - 1}{\sin x} = 0$

Q5. [6 pts]Given that $\tan\alpha = \frac{2}{5}$ where α lies in Q3, and $\cos\beta = \frac{1}{3}$ where β lies in Q4, find the value of $\sin(\alpha+\beta)$

Q6. [10 pts]Solve the following equations on the interval $[0,360°)$. **<u>Draw a sketch for each question.</u>**

a) $\sin(2x) = -\frac{1}{2}$

b) $2\sin^2 x + 3\cos x - 3 = 0$

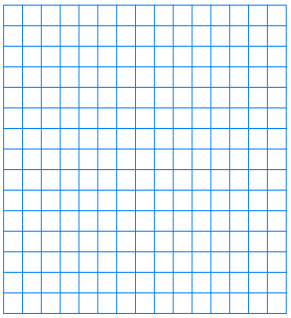
Q7. [8 pts] Solve the following system using **addition-elimination** $\begin{cases} 3x+2y-3z=-2 \\ 2x-5y+2z=-2 \\ 4x-3y+4z=10 \end{cases}$

Q8. [6 pts] Graph the system

$3x-6y \le 12$

$y \ge x^2-4$

$x^2+y^2<9$



Q9. [8 pts]Solve the following system using **<u>matrices</u>** $\begin{cases} 8x+5y+11z=30 \\ -x-4y+2z=3 \\ 2x-y+5z=12 \end{cases}$