Student Name: _____

Student ID #: _____

Circle your Instructor's Name:	Dr. Nabil 8 A.M.	Dr. Nabil 9 A.M	Dr. Kamal	Mr. Abid 10 A.M.	Mr. Abid 11 A.M.

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 17 problems. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1-4	18	
5-7	18	
8-10	18	
11-12	14	
13-14	14	
15-17	18	
Total	100	
Total	40	

Q.1 (6 pts) Use transformations of the graph of $f(x)=2^x$ to sketch the graph of $f(x)=-2^{x+2}-3$. Show the location of the asymptote. **Find the Domain and Range.**

Q.2 (4 pts) Expand the following logarithm, as much as possible: $\log_3\left(\dfrac{x^2(x-1)}{3\sqrt{x}+2}\right)^2$

Q.3 (4 pts) Solve $\log_2(x+2)=\log_2(x-3)+4$

Q.4 (4 pts) Use the **reference angle theorem** to find the exact value of $\csc 930°$

Q.5 (6 pts) Given that $\sin\theta = -\dfrac{4}{7}$ and θ lies in Quadrant 4, find the value of each of the remaining trigonometric functions.

Q.6 (6 pts) Find the amplitude, period and phase shift of the function $y = 3\cos(3x - \pi)$. **<u>Draw a graph of one period of the function</u>**

Q.7 (6 pts) Verify the identity $\dfrac{\sin x + \cos x}{\sin x} + \dfrac{\cos x + \sin x}{\cos x} = 2 + \sec x \csc x$

Q.8 (6 pts) Given that $\sin\alpha = \dfrac{3}{5}$ where α lies in Quadrant 2, and $\cos\beta = -\dfrac{5}{13}$ where β lies in Quadrant 3, find the value of $\sin(\alpha+\beta)$

Q.9 (6 pts) Solve $2\sin^2 x - 3\cos x = 0$ for x over the interval $[0°, 360°)$ or $[0, 2\pi)$

Q.10 (6 pts) Given that $A = \begin{bmatrix} 3 & 1 & 3 \\ 0 & 5 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 0 & -6 & -1 \\ 0 & 1 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} -1 & 3 \\ 6 & 1 \end{bmatrix}$. Find $A - 2C^2B$

4

Q.11 [6 pts.] Graph the solution set of the system $\begin{cases} -2 \le x \le 2 \\ y > x^2 - 4 \\ y \le 5 \end{cases}$
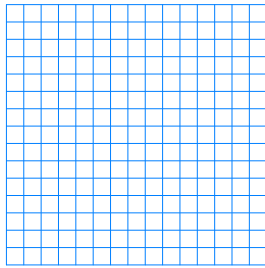
Q.12 (8 pts) Use Cramer's Rule to find the value of z **only** $\begin{cases} -4x - 6z = -12 \\ -6x - 4y - 2z = 6 \\ -x + 2y + z = 9 \end{cases}$

Do not find the values of x and y

Q.13 (8 pts) Use **_inverse_** of the coefficient matrix A^{-1} to solve $\begin{cases} 2x + 3y - z = 2 \\ x + 2y + z = 3 \\ -x - y + 3z = 1 \end{cases}$

Q.14 (6 pts) Evaluate the determinant $\begin{vmatrix} 2 & 0 & 2 & -1 \\ 0 & 1 & 1 & 0 \\ 1 & 0 & 2 & 0 \\ 0 & 2 & 0 & 1 \end{vmatrix}$

Q.15 (4 pts) Find the standard form of the equation of the parabola with its Directrix at $y = 2$ and its focus at $(3, -6)$.

Q.16 (4 pts) Given the conic section $\dfrac{(x+3)^2}{16} + \dfrac{(y-2)^2}{9} = 1$. Find the coordinates of the center and the foci.

Q.17 (10 pts) Find the asymptotes, foci, vertices and graph the conic section, $4x^2 - y^2 + 72x - 10y + 199 = 0$.