Hon Pre-Calc Quiz 7.1 – 7.4 *2017 – 2018*

Use Calculator only if the problem can't be solved algebraically. Write all general solutions in terms of Z. Circle all final answers!! No work = No credit!!

1. Solve the following system: $\begin{cases} x^2 + y^2 = 169 \\ x^2 - 8y = 104 \end{cases}$

2. Solve the following system: $\begin{cases} x^2 + y = 4 \\ e^x - y = 0 \end{cases}$

3. A small fast food restaurant invests \$10,000 to produce a new food item that will sell for \$3.99. Each item can be produced for a \$1.90

   a) Write a system of equations for the revenue and the cost that can be used to find how many of the new food items must be sold to break even.

   b) How many of the new food items must be sold to make a profit of \$12,000?

4. Two planes start from Los Angeles International Airport and fly in opposite directions. The second plane starts 45 minutes after the first plane, but its speed is 86 kilometers per hour faster. Find the airspeed of each plane if 2 hours after the first plane departs the planes are 3000 kilometers apart.

5. Solve the following system for u and v: $\begin{cases} v\tan 2x - u\sec 2x = 0 \\ u(-2\cot 2x) + v(2\sec 2x) = \tan 2x \end{cases}$

6. Solve the following system: $\begin{cases} 2x - 2y - 6z = -4 \\ -3x + 2y + 6z = 1 \\ x - y - 5z = -3 \end{cases}$

7. Solve the following system: $\begin{cases} 2x + y - 3z = 4 \\ 4x + 2z = 10 \\ -2x + 3y - 13z = -8 \end{cases}$

8. Find the equation of the parabola: $y = ax^2 + bx + c$ that passes through $(\frac{1}{2}, 1)$, $(1, 3)$ and $(2, 13)$

9. A chemist needs 12 gallons of a 20% acid solution. The solution is to be mixed from three solutions whose concentrations are 10%, 15%, and 25%. How many gallons of each solution must be used to use as little as possible of the 25% solution?

10. Write the partial fraction decomposition of the rational expression.

$$\frac{x}{16x^4 - 1}$$

11. Write the partial fraction decomposition of the rational expression.

$$\frac{16x^4}{(2x - 1)^3}$$