answer key

Precalculus Quiz#1: Spring 2022

Name:

February 16, 2022

1. An **inconsistent system** is which...

   A. has an infinite number of solutions.
   B. has more variables than equations
   C. has no solutions
   D. contains at least one polynomial term.

2. Which of the following does **not** represent a solution to the system below

   $$\begin{cases} -2x + y = 8 \\ x - y = -2 \end{cases}$$

   A. $x = -2, y = 0$
   B. $x = 3, y = 5$
   C. $x = 3, x = 2$

3. Explain how you could use **substitution** to find the answer for question (2):

   2 possible answers.
   a.) solve 2nd eq. for y. plug into 1st eq. solve for x. back substitute.
   b) plug in values from (c), confirm that eqs are false

4. A **coefficient matrix** will always contain...

   A. one more column than variables in a linear system.
   B. the same number of columns as variables in a linear system.
   C. one fewer column than variables in a linear system
   D. exactly three columns.

5. Which of the following represents the solution set for the nonsquare system below?

   $$\begin{cases} 2x - 3y + z = -2 \\ -4x + 9y + z = 7 \end{cases}$$

   A. $x = -\frac{5}{6}a - \frac{1}{6}, y = \frac{7-a}{9}, z = a$
   B. $x = \frac{1}{2} - 2a, y = 1 - a, z = a$
   C. $x = \frac{1}{2} + 2a, y = 1 + a, z = a$
   D. This is an inconsistent system.

6. Use **Gaussian elimination** to solve this system of equations. You can convert to augmented matrix form if you want to. Show all work.

$$\cancel{\begin{cases} [illegible] + [illegible] - 5z = [illegible] \\ [illegible] - 2z = 1 \\ 2x - y - z = 0 \end{cases}}$$

Extra credit: Use Gauss-Jordan elimination to find the solution set for this system.

Answer here (if you need more space, feel free to ask for scrap paper):

$$\left[\begin{array}{ccc|c} 1 & 2 & 1 & 8 \\ 2 & 1 & 2 & 10 \\ 3 & 1 & -1 & 2 \end{array}\right] \xrightarrow[R1X-3+R3]{R1X-2+R2} \left[\begin{array}{ccc|c} 1 & 2 & 1 & 8 \\ 0 & -3 & 0 & -6 \\ 0 & -5 & 4 & -22 \end{array}\right]$$

divide R2 by -3.

$$\xrightarrow{R2X5+R3} \left[\begin{array}{ccc|c} 1 & 2 & 1 & 8 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & -4 & -12 \end{array}\right] \to \left[\begin{array}{ccc|c} 1 & 2 & 1 & 8 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}\right] \xrightarrow{RX-2+R1}$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 4 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}\right] \xrightarrow{R3X-1+R1} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}\right]$$