answer key

Precalculus Quiz Review#1: Spring 2022

Name:

February 28, 2022

1. An **consistent system** is one which...

   A. has exactly one solution.
   B. has more than one solutions.
   C. has no solutions
   D. has at least one solution.

2. A **augmented matrix** will always contain...

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

3. Use the **substitution method** to solve the nonsquare system below:

$$\begin{cases} x^2 - 4x - 2y = 2 \\ -x + y = -1 \end{cases}$$

$y = x - 1$

$x^2 - 4x - 2(x-1) = 2$

$x^2 - 4x - 2x + 2 = 2$

$x^2 - 6x = 0$

$x(x-6) = 0$

$x = 0, \quad y = -1$

$x = 6, \quad y = 5$

4. Solve the **nonsquare** system below in terms of a, where a is any real number:

$$\begin{cases} 2x \quad\quad + 3z = 3 \\ 4x - 3y + 7z = 5 \end{cases}$$

$x = 3 - \frac{3}{2}a$

$y = a$

$z = 3a - 1$

$$\left[\begin{array}{ccc|c} 2 & 0 & 3 & 3 \\ 4 & -3 & 7 & 5 \end{array}\right] \xrightarrow{R1 \times -2 + R2} \left[\begin{array}{ccc|c} 2 & 0 & 3 & 3 \\ 0 & -3 & 1 & -1 \end{array}\right]$$

$-3y + 2 = -1$

$z = 3y - 1$

$2x + 3(3y - 1) = 3$

$2x + 9y - 3 = 3$

$2x = 6 - 9y$

$x = 3 - \frac{9}{2}y$

$x = 3 - \frac{3}{2}a$

$y = a$

$z = 3a - 1$

5. Use **Gaussian elimination** to solve this system of equations. Be sure to...(i) convert to augmented matrix form and (ii) use both back-substitution and Gauss-Jordan elimination to solve for x, y and z.

$$\begin{cases} x \quad\quad - 3z = -2 \\ 3x + \quad y - 2z = 5 \\ 2x + 2y + \quad z = 4 \end{cases}$$

Pivot

target

$$\left[\begin{array}{ccc|c} 1 & 0 & -3 & -2 \\ 3 & 1 & -2 & 5 \\ 2 & 2 & 1 & 4 \end{array}\right] \xrightarrow{\substack{R1 \times -3 \\ + R2}} \xrightarrow{\substack{R1 \times -2 \\ + R3}} \left[\begin{array}{ccc|c} 1 & 0 & -3 & -2 \\ 0 & 1 & 7 & 11 \\ 0 & 2 & 7 & 8 \end{array}\right]$$

target

Pivot

Use this space to continue work on (5).