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10

Math 33A First Quiz (Week 2)

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SECTION: Cross one box below

Day \ T.A.	Bon-Soon	David	Robert
Tuesday	2A	2C	2E
Thursday	2B	2D	~~2F~~

Instructions:
Solve the problem
You have 7 minutes
Use pen only

Problem 1. Solve the following system of linear equations

$$\begin{array}{rcrcrcr} & & 1 & & 0 & & -2 \\ x & + & 2y & + & 3z & = & -5 \\ -x & & & + & z & = & -3 \\ 3x & + & y & + & 3z & = & -3 \end{array}$$

~~(-5, 0, -2)~~

check:
(1 0 -2)
$1+0-6=-5$ ✓
$-1+-2=-3$ ✓
$3+0+-6=-3$ ✓

Augmented Matrix:

$$\left|\begin{array}{ccc|c} 1 & 2 & 3 & -5 \\ -1 & 0 & 1 & -3 \\ 3 & 1 & 3 & -3 \end{array}\right| \xrightarrow{+R_1,\ -3R_1} \left|\begin{array}{ccc|c} 1 & 2 & 3 & -5 \\ 0 & 2 & 4 & -8 \\ 0 & -5 & -6 & 12 \end{array}\right| \xrightarrow{+R_2}$$

$$\Rightarrow \left|\begin{array}{ccc|c} 1 & 0 & 7 & -13 \\ 0 & 2 & 4 & -8 \\ 0 & -5 & -6 & 12 \end{array}\right| \xrightarrow{\div 2} \left|\begin{array}{ccc|c} 1 & 0 & 7 & -13 \\ 0 & 1 & 2 & -4 \\ 0 & -5 & -6 & 12 \end{array}\right| \xrightarrow{+5R_2} \left|\begin{array}{ccc|c} 1 & 0 & 7 & -13 \\ 0 & 1 & 2 & -4 \\ 0 & 0 & 4 & -8 \end{array}\right| \xrightarrow{R_3/4}$$

$$\Rightarrow \left[\begin{array}{ccc|c} 1 & 0 & 7 & -13 \\ 0 & 1 & 2 & -4 \\ 0 & 0 & 1 & -2 \end{array}\right] \xrightarrow{-7R_1,\ -2R_1} \left|\begin{array}{ccc|c} 1 & 0 & 7 & -13 \\ 0 & 1 & 0 & \\ & & & \end{array}\right| \xrightarrow{} \left|\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -2 \end{array}\right|$$

∴ solution is:

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ -2 \end{pmatrix}$$