

Quiz 1 (12 pm)

1. Solve.

$$5x - y = 2$$

$$3x + 4y = 1$$

ANS.

$$x = 9/23$$

$$y = -1/23$$

(10 pts.)

$$\left[\begin{array}{cc|c} 5 & -1 & 2 \\ 3 & 4 & 1 \end{array} \right] \xrightarrow{\frac{1}{5}R_1} \left[\begin{array}{cc|c} 1 & -1/5 & 2/5 \\ 3 & 4 & 1 \end{array} \right]$$

$$\sim \begin{array}{l} \sim \\ -3R_1 + R_2 \end{array} \left[\begin{array}{cc|c} 1 & -1/5 & 2/5 \\ 0 & 4 + 3/5 & -6/5 + 1 \end{array} \right] = \left[\begin{array}{cc|c} 1 & -1/5 & 2/5 \\ 0 & 23/5 & -1/5 \end{array} \right]$$

$$\frac{1}{5} \left(-\frac{1}{23} + 2 \right) = \frac{1}{5} \left(\frac{46-1}{23} \right) = 9/23$$

$$\sim \frac{5}{23} R_2 \left[\begin{array}{cc|c} 1 & -1/5 & 2/5 \\ 0 & 1 & -1/23 \end{array} \right] \sim \frac{1}{5} R_2 + R_1 \left[\begin{array}{cc|c} 1 & 0 & \frac{1}{5} \left(-\frac{1}{23} \right) + \frac{2}{5} \\ 0 & 1 & -1/23 \end{array} \right] = \left[\begin{array}{cc|c} 1 & 0 & 9/23 \\ 0 & 1 & -1/23 \end{array} \right]$$

2. Solve.

$$x - y + 2z = 2$$

$$y - 2z = 3$$

$$x - z = -1$$

check ans. ok ✓

$$5 - 15 + 12 = 2 \checkmark$$

$$15 - 12 = 3 \checkmark$$

$$5 - 6 = -1 \checkmark$$

$$\left[\begin{array}{ccc|c} 1 & -1 & 2 & 2 \\ 0 & 1 & -2 & 3 \\ 1 & 0 & -1 & -1 \end{array} \right] \sim \begin{array}{l} -R_1 + R_3 \\ -R_1 + R_2 \end{array} \left[\begin{array}{ccc|c} 1 & -1 & 2 & 2 \\ 0 & 1 & -2 & 3 \\ 0 & 1 & -3 & -3 \end{array} \right]$$

$$\begin{array}{l} R_2 + R_1 \\ \sim \\ -R_2 + R_3 \end{array} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 5 \\ 0 & 1 & -2 & 3 \\ 0 & 0 & -1 & -6 \end{array} \right] \begin{array}{l} \sim -2R_2 + R_3 \\ -R_3 \end{array} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 5 \\ 0 & 1 & 0 & 15 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

ANS.

$$x = 5$$

$$y = 15$$

$$z = 6$$