

Name: Solution

Math 260 - Quiz # 4b

Sr #: _____

Find the value(s) of t in which the following system has infinitely many solutions:

$$x_1 + 2x_2 + x_3 = 3$$

$$2x_1 - x_2 - 3x_3 = 5$$

$$4x_1 + 3x_2 - x_3 = t$$

$$\left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 2 & -1 & -3 & 5 \\ 4 & 3 & -1 & t \end{array} \right]$$

$$\begin{array}{l} -R_1 + R_2 \\ -4R_1 + R_3 \end{array} \rightarrow \left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 0 & -5 & -5 & -1 \\ 0 & -5 & -5 & t-12 \end{array} \right]$$

$$\xrightarrow{-R_2 + R_3} \left[\begin{array}{ccc|c} 1 & 2 & 1 & 3 \\ 0 & -5 & -5 & -1 \\ 0 & 0 & 0 & t-11 \end{array} \right]$$

The system has infinitely many solutions when $t-11=0$

i.e. $t=11$