MATH 1119A Practice Test 4

This test paper has two parts. Total of 40 marks. Duration: 50 Minutes.
Part I has 3 multiple choice questions.
Part II has 3 long answer questions.
This test paper cannot be taken from the examination room.
Only nonprogrammable calculators are allowed.

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PART II: Long answer questions. Show all your work.

[**10**] **1)** Use Cramer's Rule to find y, where

$$\begin{aligned} x + y - z + 3w &= 0 \\ x + y + z + 2w &= 1 \\ -4x + 2y - z - w &= 0 \\ y + 2z - w &= 0 \end{aligned}$$

[**8**] **2)** Find the equation $y = \beta_0 + \beta_1 x$ of the least-squares line that best fits the data points $(5, 1)$, $(2, 3)$, $(6, 0)$, $(3, 2)$.

[**10**] **3)** Let the transition matrix of a Markov Chain be $T = \begin{bmatrix} 1/4 & 2/5 \\ 3/4 & 3/5 \end{bmatrix}$.

a) Find the steady state vector for T.

b) Does this Markov chain converge to a long term trend? If so, find it. If not, explain.