Assignment
Discrete Mathematics

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April 10, 2025

SUBMITTED TO
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1 Problem 1

The college catering service must decide if the mix of food that is supplied for receptions is appropriate. Of the 100 people questioned, **37** say they eat fruits, **33** say they eat vegetables, **9** say they eat cheese and fruits, **12** eat cheese and vegetables, **10** eat fruits and vegetables, **12** eat only cheese, and **3** report they eat all three offerings. How many people surveyed eat cheese? How many do not eat any of the offerings?

2 Problem 2

Solve the recurrence relation:
$$a_n = 7a_{n-2} + 6a_{n-3}, a_1 = 3, a_2 = 6, a_3 = 10$$

3 Problem 3

3.1 Determine values of the constants A and B such that $a_n = An + B$ is a solution of recurrence relation
$$a_n = 2a_{n-1} + n + 5$$

3.2 Find all solutions of this recurrence relations

3.3 Find the solution of this recurrence relation if $a_0 = 4$

4 Problem 4

By mathematical induction, show that $7^n - 2^n$ is divisible by **5** for all $n \in \mathbb{N}$