

Question 4

June attempts to solve simultaneous equations using the matrix equation $AX = B$, but discovers that A is a singular matrix.

This is

- A. a problem, since it means no solution can be found.
- B. a problem only if matrices are used.
- C. not a problem unless matrix B is also singular.
- D. not a problem. It can be solved by swapping rows.
- E. not a problem. It can be solved by swapping columns.

Use the following information to answer Questions 5 and 6.

A transition matrix is being designed to determine the likely results of a round-robin football league table, based on the results of the previous series. There are four teams in the league and they are ranked according to their points. The following transition matrix has been established from previous years' results:

$$T = \begin{bmatrix} 1.1 & 0 & 0 & 0 \\ 0 & 0.8 & 0 & 0 \\ 0 & 0 & 0.7 & 0 \\ 0 & 0 & 0 & 1.4 \end{bmatrix}, \text{ and the initial state is of the form } \begin{bmatrix} t_1 \\ t_2 \\ t_3 \\ t_4 \end{bmatrix}, \text{ where } t_1 \text{ to } t_4 \text{ are the final point totals for teams 1}$$

to 4 in the current year.

Question 5

This matrix states that

- A. team 2 can expect an 80% increase in their points from year to year.
- B. team 2 can expect an 80% decrease in their points from year to year.
- C. team 3 can expect an increase in their points from year to year.
- D. team 4 can expect a 140% increase in their points from year to year.
- E. team 4 can expect a 40% increase in their points from year to year.

Question 6

The points from 2015 are as follows.

Team name	2015 points
team 1	16
team 2	12
team 3	8
team 4	4

The predicted total for team 3 in 2019 is closest to

- A. 23
- B. 18
- C. 15
- D. 12
- E. 2