

MATH HONORS 2: EXTRA REVIEW QUESTIONS

Matrices and Probability

1. A , B , C , D and X are all 2×2 matrices. Given that $DBC^{-1}XA^{-1} = DA$, solve for X .

2. Given the system of equations:
$$\begin{cases} x + y + z = 0 \\ kx + y - 2z = -6 \\ 2y + (k + 2)z = k - 2 \end{cases}$$

(a) Determine the value(s) of k so that the system has a unique solution.

(b) Determine the value(s) of k so that the system is dependent.

(c) Determine the value(s) of k so that the system is inconsistent.

3. Given that $p(A) = 0.6$, $p(B) = 0.45$, and $p(A \cup B) = 0.85$, find

(a) $p(A \cap B)$

(b) $p(A | B')$

(c) $p(B' | A')$

4. It is known that 3 out of every 1000 people have a peculiar condition called Atkinism. A test has been devised that is 98% accurate in correctly determining whether a person has the disease or not.

(a) Find the probability of a person getting a false positive on the test (meaning that the person doesn't have Atkinism, but the test incorrectly determines that they do).

(b) Find the probability that a person actually has Atkinism, given that they tested positive.