



كلية العلوم

القسم : الرياضيات

السنة : الثانية

المادة : لغة تخصصية 2

المحاضرة : الرابعة

{{ مكتبة A to Z }}

مكتبة A to Z Facebook Group :

كلية العلوم

يمكنكم طلب المحاضرات برسالة نصية (SMS) أو عبر (What's app-Telegram) على الرقم 0931497960

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3

1. Matrix (مصفوفة)

Definition: A matrix is a rectangular array of numbers arranged in rows and columns.

Example: $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$

$\begin{bmatrix} 4 & 5 & 6 \end{bmatrix}$ (a 2×3 matrix)

2. Square Matrix (مصفوفة مربعة)

Definition: A square matrix is a matrix with the same number of rows and columns.

Example: $B = \begin{bmatrix} 1 & 2 \end{bmatrix}$

$\begin{bmatrix} 3 & 4 \end{bmatrix}$ (a 2×2 square matrix)

3. Identity Matrix (مصفوفة الوحدة)

Definition: The identity matrix is a square matrix with 1s on the main diagonal and 0s elsewhere. It is denoted by I . When multiplied by any matrix, it leaves the matrix unchanged.

Example: $I_2 = \begin{bmatrix} 1 & 0 \end{bmatrix}$

$\begin{bmatrix} 0 & 1 \end{bmatrix}$

4. Determinant (محدد)

Definition: The determinant is a special number that can be calculated from a square matrix. It tells us if the matrix is invertible and represents the scaling factor of the transformation.

Example: For matrix $\begin{bmatrix} a & b \end{bmatrix}$

$\begin{bmatrix} c & d \end{bmatrix}$, determinant = $ad - bc$

5. Mean (المتوسط الحسابي)

Definition: The mean is the average of a set of numbers. It is calculated by adding all numbers and dividing by the count.

Example: The mean of 2, 4, 6 is $(2 + 4 + 6)/3 = 4$

6. Median (الوسيط)

Definition: The median is the middle value in a set of numbers when they are arranged in order.

Examples:

- For 1, 3, 5, the median is 3
- For 1, 2, 4, 7, the median is $(2 + 4)/2 = 3$

7. Mode (المنوال)

Definition: The mode is the value that appears most frequently in a set of numbers.

Example: In 2, 3, 3, 5, 7, the mode is 3

8. Probability (احتمال)

Definition: Probability is a measure of how likely an event is to occur. It is a number between 0 and 1, where 0 means impossible and 1 means certain.

Formula: $P(\text{event}) = (\text{number of favorable outcomes}) / (\text{total number of possible outcomes})$

9. Standard Deviation (الانحراف المعياري)

Definition: Standard deviation measures how spread out numbers are from the mean. A small standard deviation means numbers are close to the mean; a large standard deviation means numbers are more spread out.

10. Range (المدى): the difference between the largest and smallest values in a data set.

Example: for the data set: 5,12,7,3,9

Range= $12 - 3 = 9$

11. Statement (عبارة)

Definition: A statement is a sentence that is either true or false, but not both.

Examples:

- "5 is greater than 3" is a true statement
- "The sky is green" is a false statement
- " $x + 2 = 5$ " is not a statement (it depends on x)

12. Negation (نفي)

Definition: The negation of a statement is the opposite of the statement. If a statement is true, its negation is false, and vice versa.

Notation: $\neg P$ or $\sim P$

Example: If P is "It is raining", then $\neg P$ is "It is not raining"

13. Conjunction (عطف / و)

Definition: A conjunction is a compound statement formed by joining two statements with "and". It is true only when both statements are true.

Notation: $P \wedge Q$

Example: "It is raining and it is cold" is true only if both are true.

14. Disjunction (فصل / أو)

Definition: A disjunction is a compound statement formed by joining two statements with "or". It is true if at least one statement is true.

Notation: $P \vee Q$

Example: "It is raining or it is snowing" is true if either is true.

15. Implication (اقتضاء / إذا... فإن)

Definition: An implication is a statement of the form "If P, then Q". It is false only when P is true and Q is false.

Notation: $P \rightarrow Q$

Example: "If it rains, then the ground will be wet"

16. If and Only If (إذا فقط إذا)

Definition: "If and only if" means that two statements are equivalent. P if and only

if Q means that if P is true then Q is true, and if Q is true then P is true.

Notation: $P \leftrightarrow Q$

Example: "A triangle has three equal sides if and only if it has three equal angles"



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