

Mathematics

1. The number of permutations of n different things taking r at a time when 3 particular things are to be included is _____.
 a) $(n-3)P_{r-3}$ b) $(n-3)P_r$ c) nPr_3 d) $r!n-3C_{r-3}$
2. The number of ways to average the letters of the word CHEESE are _____.
 a) 120 b) 240 c) 720 d) 6
3. If $15C_{3r} = 15C_{r+3}$, then r is equal to _____.
 a) 5 b) 4 c) 3 d) 2
4. If $mC_1 = nC_2$ then _____.
 a) $2m=n$ b) $2m=n(n+1)$ c) $2m=n(n-1)$ d) $2n=m(m-1)$
5. If $(n+1)C_3 = 2$, nC_{21} then $n =$ _____.
 a) 3 b) 4 c) 5 d) 6
6. For all $n \in \mathbb{N}$, $3 \times 5^{2n+1} + 2^{3n+1}$ is divisible by _____.
 a) 19 b) 17 c) 23 d) 25
7. $5C_1 + 5C_2 + 5C_3 + 5C_4 + 5C_5$ is equal to _____.
 a) 30 b) 31 c) 32 d) 33
8. The term without x in $(2x - \frac{1}{2x^2})^{12}$ is _____.
 a) 495 b) -495 c) -7920 d) 7920
9. If the sum of n terms of an A.P be $3n^2 - n$ and its common difference is 6, then its first term is _____.
 a) 2 b) 3 c) 1 d) 4
10. The value of $9^{\frac{1}{3}}, 9^{\frac{1}{9}}, 9^{\frac{1}{27}}, \dots, \infty$ is _____.
 a) 1 b) 3 c) 9 d) none of these

11. If $\sum n = 210$ then $\sum n^2 =$ _____.
 a) 2870 b) 2160 c) 2970 d) None of these
12. The coefficient of x^3 in $\sqrt{\frac{1-x}{1+x}}$, $|x| < 1$ is _____.
 a) $\frac{1}{2}$ b) $\frac{3}{8}$ c) $-\frac{3}{8}$ d) $-\frac{1}{2}$
13. The series $1 + 4x + 8x^2 + \frac{32}{3}x^3 + \dots + \infty$ is _____.
 a) e^x b) e^{4x} c) e^{2x} d) e^{8x}
14. If in an infinite G.P first term is equal to 10 times the sum of all successive terms, then its common ratio is _____.
 a) $\frac{1}{10}$ b) $\frac{1}{11}$ c) $\frac{1}{9}$ d) $\frac{1}{20}$
15. If $\frac{T_2}{T_3}$ is the expansion of $(a+b)^n$ and $\frac{T_3}{T_4}$ is the expansion of $(a+b)^{n+3}$ are equal then $n =$ _____.
 a) 3 b) 4 c) 5 d) 6
16. The value of x so that 2 is the slope of the line through (2, 5) and (x, 3) is _____.
 a) -1 b) 1 c) 0 d) 2
17. If the points (a, 0) (0, b) and (x, y) are collinear, then _____.
 a) $\frac{x}{a} - \frac{y}{b} = 1$ b) $\frac{x}{a} + \frac{y}{b} = 1$ c) $\frac{x}{a} - \frac{y}{b} = -1$ d) $\frac{x}{a} + \frac{y}{b} = 0$
18. The figure formed by the line $ax \pm by \pm c = 0$ is a _____.
 a) rectangular b) square c) rhombus d) none of these
19. When $h^2 = ab$, the angle between the pair of straight lines $ax^2 + 2hxy + by^2 = 0$ is _____.
 a) $\frac{\pi}{3}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{6}$ d) 0°
20. A point equidistant from the line $4x + 2y + 10 = 0$, $5x - 12y + 26 = 0$ and $7x + 24y - 50 = 0$ is _____.
 a) (1, -1) b) (1, 1) c) (0, 0) d) (0, 1)

21. If $7x^2 - 8xy + A = 0$ represents a pair of perpendicular lines,

then A is _____.

- a) 7 b) -7 c) -8 d) 8

22. Distance between the lines $5x + 3y - 7 = 0$ and $15x + 9y + 14 = 0$ is

- a) $\frac{35}{\sqrt{34}}$ b) $\frac{1}{3\sqrt{34}}$ c) $\frac{35}{2\sqrt{34}}$ d) $\frac{35}{2\sqrt{34}}$

23. Slope of x axis or a line parallel to x-axis is _____.

- a) 0 b) positive c) negative d) infinity

24. The angle between the lines $2x - y + 3 = 0$ and $x + 2y + 3 = 0$ is _____

- a) 90° b) 60° c) 30° d) 45°

25. The locus of a point which moves such that it maintains

equal distance from the fixed points is a _____.

- a) straight line b) line bisector c) circle d) angle bisector

26. The distance between the line $12x - 5y + 9 = 0$ and the point (2, 1)

is _____.

- a) $\pm \frac{28}{13}$ b) $\frac{28}{13}$ c) $\frac{-28}{13}$ d) none of these

27. The product of any matrix by the scalar _____ is the null

matrix.

- a) 1 b) 0 c) 7 d) matrix itself

28. If $\begin{bmatrix} 2x + y & 4x \\ 5x - 7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y - 13 \\ y & x + 6 \end{bmatrix}$, then the value of $x + y$ is _____.

- a) 5 b) 6 c) 4 d) 3

29. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ then A^2 is equal to _____.

- a) $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ b) $\begin{pmatrix} 1 & 0 \\ 1 & 0 \end{pmatrix}$ c) $\begin{pmatrix} 0 & 1 \\ 0 & 1 \end{pmatrix}$ d) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

30. If A is a matrix of order 3×3 , then $(A^2)^{-1} =$ _____.

- a) $\frac{1}{A^2}$ b) A^{-2} c) $(A^{-1})^2$ d) I

31. $|\text{Adj } A| =$ _____ where A is square matrix of order.

- a) |A| b) $|A|^2$ c) $|A|^3$ d) I

32. The value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 + \sin\theta & 1 \\ 1 & 1 & 1 + \cos\theta \end{vmatrix}$ is _____.

- a) 3 b) 1 c) 2 d) $\frac{1}{2}$

33. If A and B are square matrices of order 3 and $|A| = 5$, $|B| = 3$

then $|3AB|$ is _____.

- a) 27 b) 81 c) 135 d) 405

34. If A is square matrix of order 3, then the number of minors in

determinant of A are _____.

- a) 3 b) 21 c) 9 d) 27

35. If $\begin{pmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{pmatrix}$ is a singular matrix, then λ is _____.

- a) $\lambda = 2$ b) $\lambda \neq 2$ c) $\lambda = \frac{-8}{5}$ d) $\lambda \neq \frac{-8}{5}$

36. If $f(x) = \begin{vmatrix} 0 & x - a & x - b \\ x + a & 0 & x - c \\ x + b & x + c & x \end{vmatrix}$ then

- a) $f(a) = 0$ b) $f(b) = 0$ c) $f(0) = 0$ d) $f(1) = 0$

37. The value of $\begin{vmatrix} x + 1 & x + 2 & x + a \\ x + 2 & x + 3 & x + b \\ x + 3 & x + 4 & x + c \end{vmatrix} = 0$ where a, b, c are in H.P is

- a) $(x+1)(x+2)(x+3)$ b) I c) 0 d) $x-1$

38. The negative of a matrix is obtained by multiplying it by _____

- a) 1 b) -1 c) I d) A^{-T}

39. If $A = \begin{bmatrix} a & x \\ y & a \end{bmatrix}$ and if $xy = 1$, then $\det(AA^T)$ is equal to _____.

- a) $(a-1)^2$ b) $(a^2+1)^2$ c) (a^2-1) d) $(a^2-1)^2$

40. If A is a square matrix, then which of the following is not

symmetric?

- a) $A + A^T$ b) AA^T c) $A^T A$ d) $A - A^T$