

Term-II Maths-1 Question Bank

Q1) The slope of the line $2x + 3y + 7 = 0$ is

- a) $\left(\frac{-2}{3}\right)$ b) $\left(\frac{2}{3}\right)$ c) $\left(\frac{-3}{2}\right)$ d) $\left(\frac{3}{2}\right)$

Q.2) The slope of the line $4x - 8y - 5 = 0$ is

- a) $\left(\frac{1}{2}\right)$ b) $\left(\frac{-1}{2}\right)$ c) $\left(\frac{-5}{4}\right)$ d) $\left(\frac{8}{5}\right)$

Q3) The value of $\tan 225^\circ$ is.....

- a) -1 b) 1 c) 0 d) $\sqrt{3}$

Q4) The value of $\cos 135^\circ$ is.....

- a) -1 b) 1 c) 0 d) $\sqrt{3}$

Q 5) What the radius of the circle $x^2 + y^2 = 25$...

- a) 25 b) -5 c) 5 d) -25

Q6) What the radius of the circle $x^2 + y^2 = 64$...

- a) 64 b) 8 c) -8 d) -64

Q7) Show that the vectors $\vec{a} = 3\hat{i} + 5\hat{j} - 7\hat{k}$ and $\vec{b} = 7\hat{i} + 3\hat{k}$ are perpendicular.

Q8) Find $\vec{a} \cdot \vec{b}$, where $\vec{a} = \hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + \hat{j} - 2\hat{k}$.

Q9) Find the cosine of the angle between vectors $a = 2i - 3j + 4k$ and $b = -4i + 6j - 8k$.

Q10). If $a = 2\hat{i} - \hat{k}$, $b = -\hat{i} + 3\hat{k}$ and $c = \hat{i} + 2\hat{k}$, find scalars x, y such that $c = xa + yb$.

Q11) Find the value of 'a' if the points $(-6, 3)$ lies on locus $x = 4ay$.

Q12) Find the values of 'a' and 'b', if the points $(3, 2), (-1, -2)$ lie on the locus $ax + by = 5$.

Q13) Express the following as a sum or difference of two trigonometric ratios: $2\sin 4\theta \cdot \cos 2\theta$.

Q14) Express the following as a sum or difference of two trigonometric ratios: $2\cos 5\theta \cdot \cos \theta$.

Q15) Express the angles in radians : (i) 120° (ii) 360° .

Q16) Express the angles in degrees: (i) $\left(\frac{2\pi}{3}\right)$ (ii) $\left(\frac{3\pi}{2}\right)$

Q17) Draw the graph and find the common solution set of the following inequalities

$$4x + 3y \leq 12, \quad 3x + 5y \leq 15, \quad x \geq 0, y \geq 0.$$

Q18) Draw the graph and find the common solution set of the following inequalities

$$4x + 3y \geq -12, \quad x - 2y \geq 2, \quad x \geq 0, y \geq 0.$$

Q19) Prove that $\sqrt{2} \cdot \cos\left(\frac{\pi}{4} - A\right) = \cos A + \sin A$.

Q20) Prove that $\frac{1 + \cos\theta}{\sin\theta} = \cot\left(\frac{\theta}{2}\right)$

Q21) Prove that $\sin(25^\circ + x) \cdot \cos(25^\circ - y) - \cos(25^\circ + x) \cdot \sin(25^\circ - y) = \sin(x + y)$.

Q22) Find the values of the remaining trigonometric functions if

$$\cos\theta = \frac{4}{5} \text{ and } \frac{3\pi}{2} < \theta < 2\pi.$$

Q23) Prove that : $\sec^4 x - \sec x^2 = \tan^4 x + \tan^2 x$

Q24) Prove that $(\operatorname{cosec} x - \sin x) (\sec x - \cos x) (\tan x + \cot x) = 1$.

Q25) Prove that : $\cos 20^\circ \cdot \cos 40^\circ \cdot \cos 60^\circ \cdot \cos 80^\circ = \frac{1}{16}$

Q26) Find by using slopes, the value of k if the points A=(5, k), B=(-3, 1) & C=(-7, -2) are collinear.

Q27) Find the equation of a line passing through the point (3, -4) and (i) parallel & (ii) perpendicular to the line $5x - 2y + 3 = 0$.

Q28) Find the equation of a line with slope $-1/3$ and y - intercept -4.

Q29) Find the equation of a circle with centre at (2,-1) and which passes through the point (3,6).

Q30) Find the equation of a circle with centre at (5,4) and which radius 8.

Q31) Find the area of the triangle whose vertices are: A=(4, 5) , B=(0, 7) , C=(-1, 1).

Q32) Find k if the area of the triangle with the vertices at P(3, -5), Q(-2, k) & R(1, 4) is $\frac{33}{2}$ sq.units.

Q33) Solve the equations: $3x + 4y = 7$, $y - 2x = 3$, using Cramer's Rule.

Q34) Solve the equations: $2x + 3y = 5$, $x - 2y = -1$, using Cramer's Rule.

Q35) Find k if the equations: $7x - ky = 4$, $2x + 5y = 9$ and $2x + y = 8$ are consistent.

Q36) If $A = \begin{bmatrix} 6 & -5 & 1 \\ 4 & 2 & -1 \\ 14 & -1 & k \end{bmatrix}$ is singular matrix, find the value of k.

Q37) If $A = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 3 & -2 \end{bmatrix}$, show that $|AB| = |A| \cdot |B|$

Q38) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ show that $A^2 - 4A$ is singular.

Q39) If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 4A + 3I = 0$.

Q40) If $A = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ -3 & 2 \end{bmatrix}$, find $A \cdot B$ and $B \cdot A$

- Q 1 If $f(x)=3x^4-5x^2+7$, find $f(x-1)$.
- Q 2 If $f(x) = 2x^2 - 3x - 1$, find $f(x+2)$.
- Q 3 If $f(x) = 3x + a$ and $f(1)=7$, find a and $f(4)$.
- Q 4 If $f(x) = ax^2 + bx + 2$ and $f(1)=3$, $f(4)=42$, find a and b .
- Q 5 If $f(x) = \frac{2x+1}{5x-2}$, $x \neq \frac{5}{2}$, show that $(f \circ f)(x)=x$.
- Q 6 If $f(x) = \frac{x+3}{4x-5}$, $g(x) = \frac{3+5x}{4x-1}$, show that $(f \circ g)(x)=x$.
- Q 7 Find $f \circ g$ and $g \circ f$, where $f(x) = \frac{1}{x}$, $g(x) = \frac{x-2}{x+2}$
- Q 8 Prove that $\log 540 = 2 \log 2 + 3 \log 3 + \log 5$
- Q 9 Prove that $\log 360 = 3 \log 2 + 2 \log 3 + \log 5$
- Q 10 Evaluate : $\frac{\log_4 7}{\log_4 5} \times \frac{\log_9 5}{\log_9 7}$
- Q 11 If $x = \log_5 7$, $y = \log_7 27$ and $z = \log_3 5$, show that $xyz=3$
- Q 12 Show that $\log_y \sqrt{x} \cdot \log_z y^3 \cdot \log_x \sqrt[3]{z^2} = 1$
- Q 13 Find the value of $x^3 - x^2 + x + 46$ if $x = 2+3i$.
- Q 14 Find the value of $2x^3 - 11x^2 + 44x + 27$ if $x = \frac{25}{3-4i}$
- Q 15 Find the three numbers in G.P. such that their sum is 35 and their product is 1000.
- Q 16 Find the three numbers in G.P. such that their sum is 28 and their product is 512.
- Q 17 How many different 4-digit numbers can be formed using the digits 2, 4, 5, 4, 7, 8 if repetition of digits is not allowed?
- Q 18 How many numbers between 100 and 1000 can be formed with the digits 0,1,2,3,4,5 if the repetition of digit is not allowed?
- Q 19 In how many ways can a team of 3 boys and 2 girls be selected from 6 boys and 5 girls?
- Q 20 Find the coefficient of x^8 in the expansion of $\left(2x^5 - \frac{5}{x^3}\right)^8$
- Q 21 $\lim_{x \rightarrow 0} \left(\frac{\tan 5x}{4x}\right)$ is
- (a) 1 (b) $\frac{4}{3}$ (c) $\frac{5}{4}$ (d) None
- Q 22 $\lim_{x \rightarrow 2} \left(\frac{x^2-4}{x-2}\right)$ is
- (a) 4 (b) 2 (c) 1 (d) -4
- Q 23 $\lim_{x \rightarrow 0} \left(\frac{a^x - b^x}{x}\right)$ is
- (a) $\log(b/a)$ (b) $\log ab$ (c) $\log(a/b)$ (d) None

Q 24 $\lim_{x \rightarrow 2} \left(\frac{x^2 - 5x + 6}{x^2 - 4} \right)$ is

(a) 4 (b) $\frac{1}{4}$ (c) $-\frac{1}{4}$ (d) $\frac{5}{4}$

Q 25 Evaluate : $\lim_{x \rightarrow 0} \frac{3 \sin x - \sin 3x}{x^3}$

Q 26 Evaluate : $\lim_{x \rightarrow 0} \frac{7^x - 1}{\sin x}$

Q 27 If $y = x^2 + x + 1$ then dy/dx is

(a) $2x + 2$ (b) $2x + 1$ (c) $x + 2$ (d) $x + 1$

Q 28 If $y = \sqrt{x}$ then dy/dx is

(a) x (b) $\frac{1}{\sqrt{x}}$ (c) $\frac{1}{2\sqrt{x}}$ (d) $-\frac{1}{\sqrt{x}}$

Q 29 If $y = (\sin x + \cos x)^2$ then find dy/dx .

Q 30 Differentiate : $y = 6x^4 - 5x^3 - 4x^2$ w.r.t. x .

Q 31 Differentiate : $(x^4 + 4)(x^2 - 3)$ w.r.t. x .

Q 32 Evaluate: $\int (2x^2 - 3)^2 dx$

Q 33 If $f'(x) = 3x^2 - 4x + 7$ and $f(0) = 8$, find $f(x)$.

Q 34 Calculate quartile deviation for the following frequency distribution.

x	2	4	6	8	10	12
f	3	8	12	14	11	8

Q 35 Calculate quartile deviation for the following frequency distribution.

Wages(Rs.)	0-10	10-20	20-30	30-40	40-50
No.of workers	22	38	46	35	20

Q 36 A card is drawn from a pack of 52 cards, what is the probability that a card is either red or black?

Q 37 A bag contains 50 tickets, numbered from 1 to 50, one ticket is drawn at random. What is the probability that number on the ticket is a perfect square or divisible by 4?

Q 38 A card is drawn from a pack of 52 cards, what is the probability of it being a heart or a queen?

Q 39 If ${}^n P_r = 720$ ${}^n C_r$, then the value of 'r' is

(a) 6 (b) 5 (c) 4 (d) 7

Q 40 If ${}^7 P_3 = n$ (${}^7 C_3$), then the value of 'n' is

(a) 7 (b) 3 (c) 6 (d) 10