

The 173 most repeated JEE Main Maths questions

Ranked by how many shifts asked the same question, or the same pattern with new numbers, from 2020 to 2026. With answer key.

173

QUESTIONS

29×

MOST ASKED

141

SHIFTS COVERED

Asked in	Questions in this PDF
8 or more shifts	8 Q1 to Q8
5 to 7 shifts	4 Q9 to Q12
4 shifts	6 Q13 to Q18
3 shifts	21 Q19 to Q39
2 shifts	134 Q40 to Q173

- 1 Start at Q1: the patterns asked in the most shifts come first. Each question lists every shift that asked it.
- 2 Attempt each one on paper, then check yourself against the answer key at the end.
- 3 Got one wrong? Tap "Step-by-step solution" at the top right of it for the full working, where available.

How we ranked these

We grouped questions matched as near-identical or the same pattern with new numbers into patterns, and counted the shifts that asked each one. These are past repeats only: they say nothing about which questions a future paper will ask.

prepwisar.in/jee-main/repeated-questions/ · the method, the data and the other PDFs

Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? prepwisar.in/feedback · Terms: prepwisar.in/terms

Asked in 8 or more shifts · 8 PYQs

Q1 Determinants Asked 29×

[Step-by-step solution](#) › [prepwiser.in/questions/O_We7X_jdw](https://www.prepwiser.in/questions/O_We7X_jdw)

Asked 29 times: 7 Jan 2020 S2, 4 Sep 2020 S1, 4 Sep 2020 S2, 6 Sep 2020 S1, 27 Jul 2021 S1, 27 Aug 2021 S1, 26 Jun 2022 S2, 29 Jun 2022 S1, 29 Jul 2022 S2, 24 Jan 2023 S2, 30 Jan 2023 S2, 6 Apr 2023 S1, 11 Apr 2023 S2, 13 Apr 2023 S2, 31 Jan 2024 S1, 1 Feb 2024 S1, 1 Feb 2024 S2, 5 Apr 2024 S1, 5 Apr 2024 S2, 6 Apr 2024 S2, 8 Apr 2024 S2, 9 Apr 2024 S1, 24 Jan 2025 S1, 24 Jan 2025 S2, 2 Apr 2025 S1, 2 Apr 2025 S2, 2 Apr 2026 S2, 4 Apr 2026 S2, **8 Apr 2026 S2 (printed)**

If the system of linear equations:

$$\begin{aligned}x + y + z &= 6 \\x + 2y + 5z &= 10 \\2x + 3y + \lambda z &= \mu\end{aligned}$$

has infinitely many solutions, then the value of $\lambda + \mu$ equals:

- (A) 12 (B) 16 (C) 22 (D) 28

Q2 Statistics Asked 15×

[Step-by-step solution](#) › [prepwiser.in/questions/0nFAefpU1U](https://www.prepwiser.in/questions/0nFAefpU1U)

Asked 15 times: 7 Jan 2020 S2, 4 Sep 2020 S1, 5 Sep 2020 S1, 5 Sep 2020 S2, 20 Jul 2021 S1, 20 Jul 2021 S2, 27 Jul 2021 S1, 26 Aug 2021 S2, 27 Jun 2022 S2, 1 Feb 2023 S1, 8 Apr 2023 S1, 29 Jan 2024 S1, 31 Jan 2024 S2, 2 Apr 2025 S2, **23 Jan 2026 S1 (printed)**

Let the mean and variance of 8 numbers $-10, -7, -1, x, y, 9, 2, 16$ be $\frac{7}{2}$ and $\frac{293}{4}$, respectively.

Then the mean of 4 numbers $x, y, x + y + 1, |x - y|$ is:

- (A) 11 (B) 9 (C) 10 (D) 12

Q3 Three Dimensional Geometry Asked 12×

[Step-by-step solution](#) › [prepwiser.in/questions/eXAbxXLOMK](https://www.prepwiser.in/questions/eXAbxXLOMK)

Asked 12 times: 8 Jan 2020 S1, 27 Jun 2022 S2, 25 Jan 2023 S2, 29 Jan 2023 S2, 1 Feb 2023 S1, 8 Apr 2023 S1, 10 Apr 2023 S1, 6 Apr 2024 S1, 9 Apr 2024 S1, 23 Jan 2025 S2, 2 Apr 2025 S2, **6 Apr 2026 S2 (printed)**

The shortest distance between the lines $\frac{x-4}{1} = \frac{y-3}{2} = \frac{z-2}{-3}$ and $\frac{x+2}{2} = \frac{y-6}{4} = \frac{z-5}{-5}$ is:

- (A) $\frac{5\sqrt{6}}{6}$ (B) $2\sqrt{5}$ (C) $3\sqrt{5}$ (D) $4\sqrt{5}$

Q4 Statistics Asked 10×

[Step-by-step solution](#) › [prepwiser.in/questions/HNF3TwD8CN](https://www.prepwiser.in/questions/HNF3TwD8CN)

Asked 10 times: 8 Jan 2020 S2, 26 Aug 2021 S1, 28 Jun 2022 S1, 27 Jul 2022 S1, 8 Apr 2023 S2, 13 Apr 2023 S2, 15 Apr 2023 S1, 27 Jan 2024 S2, 6 Apr 2024 S1, **7 Apr 2025 S1 (printed)**

The mean and standard deviation of 100 observations are 40 and 5.1, respectively. By mistake one observation is taken as 50 instead of 40. If the correct mean and the correct standard deviation are μ and σ respectively, then $10(\mu + \sigma)$ is equal to

- (A) 447 (B) 445 (C) 449 (D) 451

Q5 Sequences & Series Asked 8×

[Step-by-step solution](#) › [prepwiser.in/questions/XxWr9LMrOn](https://www.prepwiser.in/questions/XxWr9LMrOn)

Asked 8 times: 27 Jun 2022 S1, 26 Jul 2022 S2, 1 Feb 2023 S1, 31 Jan 2024 S1, 2 Apr 2025 S2, 4 Apr 2025 S2, 28 Jan 2026 S2, **5 Apr 2026 S2 (printed)**

If the sum of the first 10 terms of the series $\frac{1}{1+1^4 \times 4} + \frac{2}{1+2^4 \times 4} + \frac{3}{1+3^4 \times 4} + \frac{4}{1+4^4 \times 4} + \dots$ is $\frac{m}{n}$, $\gcd(m, n) = 1$, then $m + n$ is equal to:

- (A) 256 (B) 264 (C) 276 (D) 284

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Q6 Vectors **Asked 8×**[Step-by-step solution](#) > [prepwiser.in/questions/PNhOMTj4Io](https://www.prepwiser.in/questions/PNhOMTj4Io)

Asked 8 times: 8 Jan 2020 S2, 25 Feb 2021 S1, 31 Jan 2023 S2, 1 Feb 2023 S2, 13 Apr 2023 S1, 31 Jan 2024 S1, 8 Apr 2024 S1, **5 Apr 2026 S1** (printed)

Let $\vec{a} = \sqrt{7}\hat{i} + \hat{j} - \hat{k}$ and $\vec{b} = \hat{j} + 2\hat{k}$. If $\vec{r}$ is a vector such that $\vec{r} \times \vec{a} + \vec{a} \times \vec{b} = \vec{0}$ and $\vec{r} \cdot \vec{a} = 0$, then $|3\vec{r}|^2$ is equal to:

- (A) 44 (B) 54 (C) 86 (D) 132

Q7 Three Dimensional Geometry **Asked 8×**[Step-by-step solution](#) > [prepwiser.in/questions/jjbdIbPCoF](https://www.prepwiser.in/questions/jjbdIbPCoF)

Asked 8 times: 22 Jul 2021 S2, 24 Jun 2022 S2, 24 Jan 2023 S2, 15 Apr 2023 S1, 27 Jan 2024 S1, 1 Feb 2024 S1, 6 Apr 2024 S2, **7 Apr 2025 S1** (printed)

If the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x}{1} = \frac{y}{\alpha} = \frac{z-5}{1}$ is $\frac{5}{\sqrt{6}}$, then the sum of all possible values of α is

- (A) $\frac{3}{2}$ (B) 3 (C) -3 (D) $-\frac{3}{2}$

Q8 Three Dimensional Geometry **Asked 8×**[Step-by-step solution](#) > [prepwiser.in/questions/i_3kznBkBQ](https://www.prepwiser.in/questions/i_3kznBkBQ)

Asked 8 times: 5 Sep 2020 S1, 31 Jan 2024 S2, 1 Feb 2024 S2, 5 Apr 2024 S2, 8 Apr 2024 S2, 9 Apr 2024 S2, 28 Jan 2025 S1, **2 Apr 2025 S2** (printed)

If the image of the point P(1, 0, 3) in the line joining the points A(4, 7, 1) and B(3, 5, 3) is Q(α, β, γ), then $\alpha + \beta + \gamma$ is equal to:

- (A) $\frac{46}{3}$ (B) 18 (C) 13 (D) $\frac{47}{3}$

Asked in 5 to 7 shifts · 4 PYQs**Q9** Three Dimensional Geometry **Asked 6×**[Step-by-step solution](#) > [prepwiser.in/questions/EpF-qxggbq](https://www.prepwiser.in/questions/EpF-qxggbq)

Asked 6 times: 27 Jan 2024 S1, 9 Apr 2024 S2, 23 Jan 2025 S2, 28 Jan 2025 S2, 3 Apr 2025 S2, **4 Apr 2026 S1** (printed)

The square of the distance of the point (-2, -8, 6) from the line $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z}{-1}$ along the line $\frac{x+5}{1} = \frac{y+5}{-1} = \frac{z}{2}$ is equal to:

- (A) 3 (B) 6 (C) 8 (D) 12

Q10 Area Under Curves **Asked 5×**[Step-by-step solution](#) > [prepwiser.in/questions/ZRPdwoJrE4](https://www.prepwiser.in/questions/ZRPdwoJrE4)

Asked 5 times: 7 Jan 2020 S2, 8 Jan 2020 S2, 27 Jul 2021 S2, 26 Aug 2021 S1, **7 Apr 2025 S1** (printed)

If the area of the region bounded by the curves $y = 4 - \frac{x^2}{4}$ and $y = \frac{x-4}{2}$ is equal to α , then 6α equals

- (A) 210 (B) 250 (C) 240 (D) 220

Q11 Determinants **Asked 5×**[Step-by-step solution](#) > [prepwiser.in/questions/WDbTCgLxo0](https://www.prepwiser.in/questions/WDbTCgLxo0)

Asked 5 times: 22 Jul 2021 S2, 25 Jul 2021 S1, 31 Aug 2021 S1, 26 Jun 2022 S1, **23 Jan 2025 S2** (printed)

The system of equations

$$\begin{aligned}x + y + z &= 6, \\x + 2y + 5z &= 9, \\x + 5y + \lambda z &= \mu,\end{aligned}$$

has no solution if

- (A) $\lambda = 17, \mu = 18$ (B) $\lambda = 17, \mu \neq 18$ (C) $\lambda = 15, \mu \neq 17$ (D) $\lambda \neq 17, \mu \neq 18$

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Q12 Permutations & Combinations **Asked 5×**[Step-by-step solution](#) › prepwiser.in/questions/CgvkK6R-bFAsked 5 times: 2 Sep 2020 S1, 29 Jan 2023 S2, 6 Apr 2023 S2, 11 Apr 2023 S2, **13 Apr 2023 S2 (printed)**

All words, with or without meaning, are made using all the letters of the word MONDAY. These words are written as in a dictionary with serial numbers. The serial number of the word MONDAY is:

- (A) 324 (B) 328 (C) 326 (D) 327

Asked in 4 shifts · 6 PYQs**Q13** Binomial Theorem **Asked 4×**[Step-by-step solution](#) › prepwiser.in/questions/imB0enRPW9Asked 4 times: 7 Jan 2020 S2, 25 Jun 2022 S2, 30 Jan 2023 S1, **28 Jan 2026 S2 (printed)**

The sum of the coefficients of x^{499} and x^{500} in $(1+x)^{1000} + x(1+x)^{999} + x^2(1+x)^{998} + \dots + x^{1000}$ is:

- (A) $^{1002}C_{501}$ (B) $^{1001}C_{501}$ (C) $^{1000}C_{501}$ (D) $^{1002}C_{500}$

Q14 Quadratic Equations & Polynomial Inequalities **Asked 4×**[Step-by-step solution](#) › prepwiser.in/questions/Hrq6IwYEW8Asked 4 times: 15 Apr 2023 S1, 7 Apr 2025 S2, 22 Jan 2026 S1, **24 Jan 2026 S1 (printed)**

The number of the real solutions of the equation: $|x+3| + |x-1| - 2 = 0$ is

- (A) 3 (B) 2 (C) 5 (D) 4

Q15 Area Under Curves **Asked 4×** **NUMERICAL**[Step-by-step solution](#) › prepwiser.in/questions/xps2mQeEH8Asked 4 times: 6 Sep 2020 S2, 24 Feb 2021 S2, 31 Jan 2024 S2, **5 Apr 2024 S1 (printed)**

The area of the region enclosed by the parabolas $y = x^2 - 5x$ and $y = 7x - x^2$ is _____.

Q16 Three Dimensional Geometry **Asked 4×**[Step-by-step solution](#) › prepwiser.in/questions/Hv2WS_xpRNAsked 4 times: 4 Sep 2020 S2, 27 Aug 2021 S1, 30 Jun 2022 S1, **24 Jan 2023 S1 (printed)**

The distance of the point $(-1, 9, -16)$ from the plane

$2x + 3y - z = 5$ measured parallel to the line

$\frac{x+4}{3} = \frac{2-y}{4} = \frac{z-3}{12}$ is:

- (A) $13\sqrt{2}$ (B) 26 (C) $20\sqrt{2}$ (D) 31

Q17 Binomial Theorem **Asked 4×**[Step-by-step solution](#) › prepwiser.in/questions/RKigFz3tC0Asked 4 times: 27 Jul 2021 S1, 30 Jan 2023 S1, 6 Apr 2023 S2, **10 Apr 2023 S1 (printed)**

If the coefficient of x^7 in $(ax - \frac{1}{bx^2})^{13}$ and the coefficient of x^{-5} in $(ax + \frac{1}{bx^2})^{13}$ are equal, then a^4b^4 is equal to:

- (A) 22 (B) 33 (C) 44 (D) 11

Q18 Three Dimensional Geometry **Asked 4×**[Step-by-step solution](#) › prepwiser.in/questions/WrT9qRY-Z2Asked 4 times: 24 Feb 2021 S2, 17 Mar 2021 S1, 26 Aug 2021 S2, **31 Aug 2021 S1 (printed)**

Let the equation of the plane, that passes through the point $(1, 4, -3)$ and contains the line of intersection of the

planes $3x - 2y + 4z - 7 = 0$

and $x + 5y - 2z + 9 = 0$, be

$\alpha x + \beta y + \gamma z + 3 = 0$, then $\alpha + \beta + \gamma$ is equal to:

- (A) -23 (B) -15 (C) 23 (D) 15

Q19 Binomial Theorem **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/askUb0MHD7](https://www.prepwisar.in/questions/askUb0MHD7)

Asked 3 times: 3 Sep 2020 S2, 31 Aug 2021 S1, **4 Apr 2026 S2 (printed)**

In the expansion of $\left(9x - \frac{1}{3\sqrt{x}}\right)^{18}$, $x > 0$, if the term independent of x is $(221)^k$, then k is equal to:

- (A) 84 (B) 78 (C) 168 (D) 198

Q20 Ellipse **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/KU3MFczZG](https://www.prepwisar.in/questions/KU3MFczZG)

Asked 3 times: 4 Sep 2020 S1, 7 Apr 2025 S2, **24 Jan 2026 S2 (printed)**

Let the length of the latus rectum of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, ($a > b$), be 30. If its eccentricity is the maximum value of the function $f(t) = -\frac{3}{4} + 2t - t^2$, then $(a^2 + b^2)$ is equal to

- (A) 276 (B) 516 (C) 256 (D) 496

Q21 Permutations & Combinations **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/0z83zf9Hpb](https://www.prepwisar.in/questions/0z83zf9Hpb)

Asked 3 times: 25 Jul 2022 S1, 29 Jan 2024 S1, **24 Jan 2026 S2 (printed)**

The letters of the word "UDAYPUR" are written in all possible ways with or without meaning and these words are arranged as in a dictionary. The rank of the word "UDAYPUR" is

- (A) 1579 (B) 1578 (C) 1580 (D) 1581

Q22 Permutations & Combinations **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/HIhsDpCwwO](https://www.prepwisar.in/questions/HIhsDpCwwO)

Asked 3 times: 8 Apr 2023 S1, 2 Apr 2025 S1, **21 Jan 2026 S2 (printed)**

The largest $n \in \mathbb{N}$, for which 7^n divides $101!$, is:

- (A) 18 (B) 15 (C) 19 (D) 16

Q23 Differential Equations **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/B9OZnBHT1B](https://www.prepwisar.in/questions/B9OZnBHT1B)

Asked 3 times: 29 Jun 2022 S1, 28 Jul 2022 S1, **22 Jan 2026 S1 (printed)**

Let the solution curve of the differential equation $xdy - ydx = \sqrt{x^2 + y^2}dx$, $x > 0$, $y(1) = 0$, be $y = y(x)$. Then $y(3)$ is equal to

- (A) 6 (B) 4 (C) 1 (D) 2

Q24 Area Under Curves **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/LIbZaAGXij](https://www.prepwisar.in/questions/LIbZaAGXij)

Asked 3 times: 1 Feb 2023 S2, 28 Jan 2026 S1, **5 Apr 2026 S1 (printed)**

The area of the region $R = \{(x, y) : xy \leq 27, 1 \leq y \leq x^2\}$ is equal to:

- (A) $78 \log_e 3 - \frac{52}{3}$ (B) $54 \log_e 3 - \frac{52}{3}$ (C) $54 \log_e 3 - \frac{26}{3}$ (D) $54 \log_e 3 + \frac{26}{3}$

Q25 Binomial Theorem **Asked 3×**

[Step-by-step solution](#) › [prepwisar.in/questions/Fv_gSgxjDY](https://www.prepwisar.in/questions/Fv_gSgxjDY)

Asked 3 times: 29 Jul 2022 S1, 6 Apr 2023 S1, **4 Apr 2025 S1 (printed)**

In the expansion of $\left(\sqrt[3]{2} + \frac{1}{\sqrt[3]{3}}\right)^n$, $n \in \mathbb{N}$, if the ratio of 15th term from the beginning to the 15th term from the end is $\frac{1}{6}$, then the value of ${}^nC_3$ is

- (A) 4960 (B) 2300 (C) 1040 (D) 4060

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Q26 Permutations & Combinations **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/KB5TY27M1R](https://www.prepwiser.in/questions/KB5TY27M1R)Asked 3 times: 26 Feb 2021 S1, 13 Apr 2023 S1, **29 Jan 2025 S1 (printed)**

Let P be the set of seven digit numbers with sum of their digits equal to 11. If the numbers in P are formed by using the digits 1, 2 and 3 only, then the number of elements in the set P is:

- (A) 164 (B) 158 (C) 161 (D) 173

Q27 Relations & Functions (Basic) **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/dzISQ5Frb4](https://www.prepwiser.in/questions/dzISQ5Frb4)Asked 3 times: 24 Jan 2023 S2, 31 Jan 2024 S1, **23 Jan 2025 S1 (printed)**

Let $R = \{(1, 2), (2, 3), (3, 3)\}$ be a relation defined on the set $\{1, 2, 3, 4\}$. Then the minimum number of elements, needed to be added in R so that R becomes an equivalence relation, is:

- (A) 9 (B) 8 (C) 7 (D) 10

Q28 Sequences & Series **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/wI4PkJgab2](https://www.prepwiser.in/questions/wI4PkJgab2)Asked 3 times: 22 Jul 2021 S2, 30 Jan 2024 S1, **24 Jan 2025 S2 (printed)**

In an arithmetic progression, if $S_{40} = 1030$ and $S_{12} = 57$, then $S_{30} - S_{10}$ is equal to:

- (A) 525 (B) 505 (C) 510 (D) 515

Q29 Determinants **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/BIUegCiaw-](https://www.prepwiser.in/questions/BIUegCiaw-)Asked 3 times: 6 Sep 2020 S1, 1 Feb 2023 S1, **29 Jan 2025 S1 (printed)**

Let M and m respectively be the maximum and the minimum values of

$$f(x) = \begin{vmatrix} 1 + \sin^2 x & \cos^2 x & 4 \sin 4x \\ \sin^2 x & 1 + \cos^2 x & 4 \sin 4x \\ \sin^2 x & \cos^2 x & 1 + 4 \sin 4x \end{vmatrix}, x \in R$$

Then $M^4 - m^4$ is equal to:

- (A) 1280 (B) 1040 (C) 1215 (D) 1295

Q30 Binomial Theorem **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/uiSr6cavsN](https://www.prepwiser.in/questions/uiSr6cavsN)Asked 3 times: 18 Mar 2021 S2, 25 Jul 2021 S1, **2 Apr 2025 S1 (printed)**

The term independent of x in the expansion of $\left(\frac{(x+1)}{(x^{2/3}+1-x^{1/3})} - \frac{(x-1)}{(x-x^{1/2})} \right)^{10}$, $x > 1$, is:

- (A) 240 (B) 120 (C) 150 (D) 210

Q31 Indefinite Integration **Asked 3×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/zgR1FEzUp3](https://www.prepwiser.in/questions/zgR1FEzUp3)Asked 3 times: 9 Jan 2020 S1, 31 Aug 2021 S1, **8 Apr 2024 S2 (printed)**

If $\int \frac{1}{\sqrt[5]{(x-1)^4(x+3)^6}} dx = A \left(\frac{\alpha x - 1}{\beta x + 3} \right)^B + C$, where C is the constant of integration, then the value of $\alpha + \beta + 20AB$ is _____.

Q32 Area Under Curves **Asked 3×**[Step-by-step solution](#) › [prepwiser.in/questions/yrz7xINHol](https://www.prepwiser.in/questions/yrz7xINHol)Asked 3 times: 24 Jan 2023 S1, 24 Jan 2023 S2, **30 Jan 2024 S1 (printed)**

The area (in square units) of the region bounded by the parabola $y^2 = 4(x - 2)$ and the line $y = 2x - 8$, is:

- (A) 7 (B) 8 (C) 9 (D) 6

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Q33 Probability: Advanced **Asked 3×** **NUMERICAL**
Asked 3 times: 28 Jul 2022 S2, 5 Apr 2024 S1, 6 Apr 2024 S2 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/p5uinw3U--

From a lot of 12 items containing 3 defectives, a sample of 5 items is drawn at random. Let the random variable X denote the number of defective items in the sample. Let items in the sample be drawn one by one without replacement. If variance of X is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then $n - m$ is equal to _____.

Q34 Three Dimensional Geometry **Asked 3×**
Asked 3 times: 26 Feb 2021 S2, 29 Jun 2022 S1, 11 Apr 2023 S1 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/asD69mxjnr

Let (α, β, γ) be the image of the point $P(2, 3, 5)$ in the plane $2x + y - 3z = 6$. Then $\alpha + \beta + \gamma$ is equal to:

- (A) 10 (B) 9 (C) 5 (D) 12

Q35 Functions (Advanced) **Asked 3×**
Asked 3 times: 25 Feb 2021 S2, 27 Jun 2022 S1, 24 Jan 2023 S2 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/RcDS61ffZB

If $f(x) = \frac{2^{2x}}{2^{2x}+2}$, $x \in \mathbb{R}$, then

$$f\left(\frac{1}{2023}\right) + f\left(\frac{2}{2023}\right) + \dots + f\left(\frac{2022}{2023}\right)$$

is equal to

- (A) 2011 (B) 2010 (C) 1010 (D) 1011

Q36 Permutations & Combinations **Asked 3×** **NUMERICAL**
Asked 3 times: 26 Feb 2021 S2, 26 Jun 2022 S2, 29 Jan 2023 S2 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/ocweAsMhIn

The total number of 4-digit numbers whose greatest common divisor with 54 is 2, is _____.

Q37 Three Dimensional Geometry **Asked 3×**
Asked 3 times: 7 Jan 2020 S1, 10 Apr 2023 S2, 15 Apr 2023 S1 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/9WRtW7dxLD

Let the foot of perpendicular of the point $P(3, -2, -9)$ on the plane passing through the points $(-1, -2, -3)$, $(9, 3, 4)$, $(9, -2, 1)$ be $Q(\alpha, \beta, \gamma)$. Then the distance of Q from the origin is:

- (A) $\sqrt{38}$ (B) $\sqrt{29}$ (C) $\sqrt{42}$ (D) $\sqrt{35}$

Q38 Three Dimensional Geometry **Asked 3×**
Asked 3 times: 24 Feb 2021 S1, 27 Jul 2021 S1, 11 Apr 2023 S1 (printed)

[Step-by-step solution](#) › prepwiser.in/questions/YJctHNh4aK

If equation of the plane that contains the point $(-2, 3, 5)$ and is perpendicular to each of the planes $2x + 4y + 5z = 8$ and $3x - 2y + 3z = 5$ is $\alpha x + \beta y + \gamma z + 97 = 0$ then $\alpha + \beta + \gamma =$

- (A) 15 (B) 16 (C) 17 (D) 18

Q39 Quadratic Equations & Polynomial Inequalities **Asked 3×** **NUMERICAL**

[Step-by-step solution](#) › prepwiser.in/questions/c4HJzD-NsA

Asked 3 times: 9 Jan 2020 S1, 27 Jul 2021 S2, 28 Jun 2022 S1 (printed)

The number of real solutions of the equation $e^{4x} + 4e^{3x} - 58e^{2x} + 4e^x + 1 = 0$ is _____.

Q40 Binomial Theorem **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/QDOG0PQT28](https://www.prepwiser.in/questions/QDOG0PQT28)

Asked 2 times: 1 Feb 2023 S1, **24 Jan 2026 S1 (printed)**

Let $S = \frac{1}{25!} + \frac{1}{3!23!} + \frac{1}{5!21!} + \dots$ up to 13 terms. If $13S = \frac{2^k}{n!}$, $k \in \mathbb{N}$, then $n + k$ is equal to

- (A) 50 (B) 52 (C) 49 (D) 51

Q41 Matrices **Asked 2×** **NUMERICAL**

[Step-by-step solution](#) › [prepwiser.in/questions/_e9ee-yPzx](https://www.prepwiser.in/questions/_e9ee-yPzx)

Asked 2 times: 16 Mar 2021 S1, **24 Jan 2026 S1 (printed)**

The number of 3×2 matrices A , which can be formed using the elements of the set $\{-2, -1, 0, 1, 2\}$ such that the sum of all the diagonal elements of $A^T A$ is 5, is

Q42 Parabola **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/bVyUT8_IzC](https://www.prepwiser.in/questions/bVyUT8_IzC)

Asked 2 times: 8 Apr 2023 S1, **28 Jan 2026 S2 (printed)**

Let A be the focus of the parabola $y^2 = 8x$. Let the line $y = mx + c$ intersect the parabola at two distinct points B and C . If the centroid of the triangle ABC is $(\frac{7}{3}, \frac{4}{3})$, then $(BC)^2$ is equal to:

- (A) 89 (B) 80 (C) 32 (D) 41

Q43 Determinants **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/2N8gzUWnk1](https://www.prepwiser.in/questions/2N8gzUWnk1)

Asked 2 times: 24 Jan 2023 S1, **22 Jan 2026 S2 (printed)**

Let n be the number obtained on rolling a fair die. If the probability that the system

$$\begin{aligned} x - ny + z &= 6 \\ x + (n-2)y + (n+1)z &= 8 \\ (n-1)y + z &= 1 \end{aligned}$$

has a unique solution is $\frac{k}{6}$, then the sum of k and all possible values of n is:

- (A) 22 (B) 20 (C) 24 (D) 21

Q44 Permutations & Combinations **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/xf9YqZqOXI](https://www.prepwiser.in/questions/xf9YqZqOXI)

Asked 2 times: 6 Apr 2023 S2, **6 Apr 2026 S1 (printed)**

The number of 4-letter words, with or without meaning, each consisting of two vowels and two consonants that can be formed from the letters of the word INCONSEQUENTIAL, without repeating any letter, is:

- (A) 2670 (B) 2840 (C) 2920 (D) 3600

Q45 Circles **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/u08bgAbEsA](https://www.prepwiser.in/questions/u08bgAbEsA)

Asked 2 times: 30 Jan 2024 S1, **22 Jan 2026 S1 (printed)**

Let the set of all values of r , for which the circles $(x+1)^2 + (y+4)^2 = r^2$ and $x^2 + y^2 - 4x - 2y - 4 = 0$ intersect at two distinct points be the interval (α, β) . Then $\alpha\beta$ is equal to

- (A) 21 (B) 24 (C) 20 (D) 25

Q46 Differential Equations **Asked 2×**

[Step-by-step solution](#) › [prepwiser.in/questions/9-tZ8JfqjV](https://www.prepwiser.in/questions/9-tZ8JfqjV)

Asked 2 times: 25 Jun 2022 S2, **2 Apr 2026 S2 (printed)**

Let $x = x(y)$ be the solution of the differential equation $2y^2 \frac{dx}{dy} - 2xy + x^2 = 0$, $y > 1$, $x(e) = e$.

Then $x(e^2)$ is equal to:

- (A) $\frac{3}{2}e^2$ (B) $\frac{2}{3}e^2$ (C) e^2 (D) $2e^2$

Q47 Sequences & Series **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/9TpsoTqfxlAsked 2 times: 6 Sep 2020 S2, **28 Jan 2026 S1 (printed)**

The common difference of the A.P.: $a_1, a_2, \dots, a_m$ is 13 more than the common difference of the A.P.: $b_1, b_2, \dots, b_n$. If $b_{31} = -277$, $b_{43} = -385$ and $a_{78} = 327$, then a_1 is equal to

- (A) 21 (B) 19 (C) 24 (D) 16

Q48 Permutations & Combinations **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/ngOmnj40haAsked 2 times: 31 Jan 2024 S2, **23 Jan 2026 S2 (printed)**

The number of ways, in which 16 oranges can be distributed to four children such that each child gets at least one orange, is

- (A) 384 (B) 403 (C) 429 (D) 455

Q49 Definite Integration **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/vRQP7BjmrAsked 2 times: 25 Jul 2021 S1, **23 Jan 2026 S1 (printed)**

The value of the integral $\int_{\frac{\pi}{24}}^{\frac{5\pi}{24}} \frac{dx}{1 + \sqrt[3]{\tan 2x}}$ is:

- (A) $\frac{\pi}{3}$ (B) $\frac{\pi}{18}$ (C) $\frac{\pi}{6}$ (D) $\frac{\pi}{12}$

Q50 Relations & Functions (Basic) **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/IVK1sHaw6lAsked 2 times: 6 Apr 2024 S2, **21 Jan 2026 S2 (printed)**

Let $A = \{2, 3, 5, 7, 9\}$. Let R be the relation on A defined by xRy if and only if $2x \leq 3y$. Let l be the number of elements in R , and m be the minimum number of elements required to be added in R to make it a symmetric relation. Then $l + m$ is equal to:

- (A) 21 (B) 25 (C) 23 (D) 27

Q51 Functions (Advanced) **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/DN-IJC66vMAsked 2 times: 3 Apr 2025 S2, **24 Jan 2026 S2 (printed)**

Let f be a function such that $3f(x) + 2f\left(\frac{m}{19x}\right) = 5x$, $x \neq 0$, where $m = \sum_{i=1}^9 (i)^2$. Then $f(5) - f(2)$ is equal to

- (A) 36 (B) 9 (C) -9 (D) 18

Q52 Differential Equations **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/o3kPk-xmhCAsked 2 times: 5 Apr 2024 S1, **24 Jan 2026 S2 (printed)**

Let $y = y(x)$ be a differentiable function in the interval $(0, \infty)$ such that $y(1) = 2$, and $\lim_{t \rightarrow x} \left(\frac{t^2 y(x) - x^2 y(t)}{x - t} \right) = 3$ for each $x > 0$. Then $2y(2)$ is equal to:

- (A) 27 (B) 18 (C) 23 (D) 12

Q53 Three Dimensional Geometry **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > prepwiser.in/questions/IM247WrkKQAsked 2 times: 25 Feb 2021 S2, **8 Apr 2026 S2 (printed)**

Let a line L_1 pass through the origin and be perpendicular to the lines

$$L_2 : \vec{r} = (3 + t)\hat{i} + (2t - 1)\hat{j} + (2t + 4)\hat{k} \text{ and}$$

$$L_3 : \vec{r} = (3 + 2s)\hat{i} + (3 + 2s)\hat{j} + (2 + s)\hat{k}, t, s \in \mathbf{R}.$$

If (a, b, c) , $a \in \mathbf{Z}$, is the point on L_3 at a distance of $\sqrt{17}$ from the point of intersection of L_1 and L_2 , then $(a + b + c)^2$ is equal to ____.

Q54 Relations & Functions (Basic) **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/7x2zlhDakX](https://www.prepwisar.in/questions/7x2zlhDakX)Asked 2 times: 15 Apr 2023 S1, **24 Jan 2026 S1 (printed)**Let R be a relation defined on the set $\{1, 2, 3, 4\} \times \{1, 2, 3, 4\}$ by

$$R = \{(a, b), (c, d) : 2a + 3b = 3c + 4d\}.$$

Then the number of elements in R is

- (A) 6 (B) 15 (C) 12 (D) 18

Q55 Sequences & Series **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/4iAKogjWv3](https://www.prepwisar.in/questions/4iAKogjWv3)Asked 2 times: 7 Jan 2020 S2, **8 Apr 2026 S2 (printed)**Let $\alpha = 3 + 4 + 8 + 9 + 13 + 14 + \dots$ upto 40 terms. If $(\tan \beta)^{\frac{\alpha}{1020}}$ is a root of the equation $x^2 + x - 2 = 0$, $\beta \in (0, \frac{\pi}{2})$, then $\sin^2 \beta + 3 \cos^2 \beta$ is equal to:

- (A) 2 (B) $\frac{7}{4}$ (C) $\frac{5}{2}$ (D) $\frac{3}{2}$

Q56 Limits **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/YAK06OPz_](https://www.prepwisar.in/questions/YAK06OPz_)Asked 2 times: 16 Mar 2021 S1, **22 Jan 2026 S2 (printed)**If $\lim_{x \rightarrow 0} \frac{e^{(a-1)x} + 2 \cos bx + (c-2)e^{-x}}{x \cos x - \log_e(1+x)} = 2$, then $a^2 + b^2 + c^2$ is equal to:

- (A) 3 (B) 5 (C) 9 (D) 7

Q57 Probability: Advanced **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/qB9fYKnRkw](https://www.prepwisar.in/questions/qB9fYKnRkw)Asked 2 times: 9 Jan 2020 S2, **22 Jan 2026 S1 (printed)**If a random variable x has the probability distribution

x	0	1	2	3	4	5	6	7
$P(x)$	0	$2k$	k	$3k$	$2k^2$	$2k$	$k^2 + k$	$7k^2$

then $P(3 < x \leq 6)$ is equal to

- (A) 0.34 (B) 0.64 (C) 0.22 (D) 0.33

Q58 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/6phEZO8XmO](https://www.prepwisar.in/questions/6phEZO8XmO)Asked 2 times: 27 Aug 2021 S2, **23 Jan 2026 S1 (printed)**Let the direction cosines of two lines satisfy the equations: $4l + m - n = 0$ and

$$2mn + 10nl + 3lm = 0.$$

Then the cosine of the acute angle between these lines is:

- (A) $\frac{10}{7\sqrt{38}}$ (B) $\frac{10}{\sqrt{38}}$ (C) $\frac{10}{3\sqrt{38}}$ (D) $\frac{20}{3\sqrt{38}}$

Q59 Area Under Curves **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/VySf_KiIqu](https://www.prepwisar.in/questions/VySf_KiIqu)Asked 2 times: 25 Jan 2023 S1, **28 Jan 2026 S2 (printed)**Let $P_1 : y = 4x^2$ and $P_2 : y = x^2 + 27$ be two parabolas. If the area of the bounded region enclosed between P_1 and P_2 is six times the area of the bounded region enclosed between the line $y = \alpha x$, $\alpha > 0$ and P_1 , then α is equal to:

- (A) 12 (B) 15 (C) 8 (D) 6

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Q60 Statistics **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/ioIEcMGHqhAsked 2 times: 2 Sep 2020 S1, **24 Jan 2026 S2 (printed)**

Let $X = \{x \in \mathbb{N} : 1 \leq x \leq 19\}$ and for some $a, b \in \mathbb{R}$, $Y = \{ax + b : x \in X\}$. If the mean and variance of the elements of Y are 30 and 750, respectively, then the sum of all possible values of b is

- (A) 20 (B) 100 (C) 80 (D) 60

Q61 Sequences & Series **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/PWnLvO1QdoAsked 2 times: 29 Jul 2022 S1, **5 Apr 2026 S1 (printed)**

$\sum_{n=1}^{10} \left(\frac{528}{n(n+1)(n+2)} \right)$ is equal to:

- (A) 65 (B) 130 (C) 220 (D) 440

Q62 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/HRbEnS9Tq0Asked 2 times: 25 Jan 2023 S1, **5 Apr 2026 S1 (printed)**

The square of the distance of the point $P(5, 6, 7)$ from the line $\frac{x-2}{2} = \frac{y-5}{3} = \frac{z-2}{4}$ is equal to:

- (A) 3 (B) 5 (C) 6 (D) 8

Q63 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/gxVhGWvnK7Asked 2 times: 1 Feb 2024 S2, **5 Apr 2026 S2 (printed)**

Let a triangle PQR be such that P and Q lie on the line $\frac{x+3}{8} = \frac{y-4}{2} = \frac{z+1}{2}$ and are at a distance of 6 units from $R(1, 2, 3)$. If (α, β, γ) is the centroid of $\triangle PQR$, then $\alpha + \beta + \gamma$ is equal to:

- (A) 4 (B) 5 (C) 6 (D) 8

Q64 Definite Integration **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/1qSrWQgg7BAsked 2 times: 2 Apr 2025 S2, **22 Jan 2026 S1 (printed)**

Let $f : [1, \infty) \rightarrow \mathbb{R}$ be a differentiable function. If $6 \int_1^x f(t) dt = 3xf(x) + x^3 - 4$ for all $x \geq 1$, then the value of $f(2) - f(3)$ is:

- (A) 4 (B) 3 (C) -4 (D) -3

Q65 Trigonometric Equations **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > prepwiser.in/questions/q2ETOWDVikAsked 2 times: 25 Jan 2023 S2, **5 Apr 2026 S2 (printed)**

If $S = \left\{ \theta \in [-\pi, \pi] : \cos \theta \cos \frac{5\theta}{2} = \cos 7\theta \cos \frac{7\theta}{2} \right\}$, then $n(S)$ is equal to ____.

Q66 Statistics **Asked 2×**[Step-by-step solution](#) > prepwiser.in/questions/CTVdd2zio0Asked 2 times: 4 Apr 2026 S2, **6 Apr 2026 S1 (printed)**

A data consists of 20 observations $x_1, x_2, \dots, x_{20}$. If $\sum_{i=1}^{20} (x_i + 5)^2 = 2500$ and $\sum_{i=1}^{20} (x_i - 5)^2 = 100$, then the ratio of mean to standard deviation of this data is:

- (A) 2 : 1 (B) 3 : 1 (C) 3 : 2 (D) 4 : 1

Q67 Quadratic Equations & Polynomial Inequalities **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > prepwiser.in/questions/r-y550989jAsked 2 times: 23 Jan 2026 S2, **8 Apr 2026 S2 (printed)**

The sum of squares of all the real solutions of the equation $\log_{(x+1)} (2x^2 + 5x + 3) = 4 - \log_{(2x+3)} (x^2 + 2x + 1)$ is equal to ____.

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Q68 Sequences & Series **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/U45GjD0Q4T](https://www.prepwiser.in/questions/U45GjD0Q4T)Asked 2 times: 27 Jan 2024 S1, **24 Jan 2025 S2 (printed)**If $7 = 5 + \frac{1}{7}(5 + \alpha) + \frac{1}{7^2}(5 + 2\alpha) + \frac{1}{7^3}(5 + 3\alpha) + \dots \infty$, then the value of α is:

- (A) $\frac{1}{7}$ (B) 1 (C) $\frac{6}{7}$ (D) 6

Q69 Sequences & Series **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/i3xWmvCMjQ](https://www.prepwiser.in/questions/i3xWmvCMjQ)Asked 2 times: 5 Sep 2020 S2, **7 Apr 2025 S2 (printed)**

If the sum of the second, fourth and sixth terms of a G.P. of positive terms is 21 and the sum of its eighth, tenth and twelfth terms is 15309, then the sum of its first nine terms is:

- (A) 757 (B) 755 (C) 750 (D) 760

Q70 Relations & Functions (Basic) **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/LwUdOk2jxa](https://www.prepwiser.in/questions/LwUdOk2jxa)Asked 2 times: 12 Apr 2023 S1, **22 Jan 2025 S2 (printed)**Let $A = \{1, 2, 3\}$. The number of relations on A , containing $(1, 2)$ and $(2, 3)$, which are reflexive and transitive but not symmetric, is _____.**Q71** Trigonometric Equations **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/P6ubRSBU24](https://www.prepwiser.in/questions/P6ubRSBU24)Asked 2 times: 17 Mar 2021 S2, **3 Apr 2025 S1 (printed)**The number of solutions of the equation $2x + 3 \tan x = \pi, x \in [-2\pi, 2\pi] - \left\{ \pm \frac{\pi}{2}, \pm \frac{3\pi}{2} \right\}$ is:

- (A) 4 (B) 5 (C) 3 (D) 6

Q72 Binomial Theorem **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/toPoqyVmsR](https://www.prepwiser.in/questions/toPoqyVmsR)Asked 2 times: 3 Sep 2020 S1, **29 Jan 2025 S1 (printed)**The least value of n for which the number of integral terms in the Binomial expansion of $(\sqrt[3]{7} + \sqrt[12]{11})^n$ is 183, is:

- (A) 2184 (B) 2172 (C) 2196 (D) 2148

Q73 Ellipse **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/4Nc-eEG7GV](https://www.prepwiser.in/questions/4Nc-eEG7GV)Asked 2 times: 30 Jan 2024 S1, **2 Apr 2025 S2 (printed)**

If the length of the minor axis of an ellipse is equal to one fourth of the distance between the foci, then the eccentricity of the ellipse is:

- (A) $\frac{3}{\sqrt{19}}$ (B) $\frac{\sqrt{3}}{16}$ (C) $\frac{4}{\sqrt{17}}$ (D) $\frac{\sqrt{5}}{7}$

Q74 Trigonometric Ratios & Identities **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/2e5Gq1cq-i](https://www.prepwiser.in/questions/2e5Gq1cq-i)Asked 2 times: 18 Mar 2021 S2, **4 Apr 2025 S1 (printed)**If $10 \sin^4 \theta + 15 \cos^4 \theta = 6$, then the value of $\frac{27 \operatorname{cosec}^6 \theta + 8 \sec^6 \theta}{16 \sec^8 \theta}$ is

- (A) $\frac{2}{5}$ (B) $\frac{3}{5}$ (C) $\frac{1}{5}$ (D) $\frac{3}{4}$

Q75 Differential Equations **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/i8f14fybJO](https://www.prepwiser.in/questions/i8f14fybJO)Asked 2 times: 26 Jul 2022 S2, **22 Jan 2025 S2 (printed)**Let $y = f(x)$ be the solution of the differential equation $\frac{dy}{dx} + \frac{xy}{x^2 - 1} = \frac{x^6 + 4x}{\sqrt{1 - x^2}}, -1 < x < 1$ such that $f(0) = 0$. If $6 \int_{-1/2}^{1/2} f(x) dx = 2\pi - \alpha$ then α^2 is equal to _____.

Q76 Area Under Curves **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/8LkV5LF0Vo](https://www.prepwiser.in/questions/8LkV5LF0Vo)Asked 2 times: 25 Jul 2022 S1, **7 Apr 2025 S2 (printed)**If the area of the region $\{(x, y) : 1 + x^2 \leq y \leq \min\{x + 7, 11 - 3x\}\}$ is A , then $3A$ is equal to:

- (A) 50 (B) 46 (C) 49 (D) 47

Q77 Probability: Basic **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/KXKh1zpN3_](https://www.prepwiser.in/questions/KXKh1zpN3_)Asked 2 times: 11 Apr 2023 S1, **24 Jan 2025 S2 (printed)**Let $A = [a_{ij}]$ be a square matrix of order 2 with entries either 0 or 1. Let E be the event that A is an invertible matrix. Then the probability $P(E)$ is:

- (A) $\frac{3}{8}$ (B) $\frac{1}{8}$ (C) $\frac{3}{16}$ (D) $\frac{5}{8}$

Q78 Binomial Theorem **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/r_kAoRZzUx](https://www.prepwiser.in/questions/r_kAoRZzUx)Asked 2 times: 10 Apr 2023 S2, **23 Jan 2025 S2 (printed)**If in the expansion of $(1 + x)^p(1 - x)^q$, the coefficients of x and x^2 are 1 and -2, respectively, then $p^2 + q^2$ is equal to:

- (A) 8 (B) 20 (C) 13 (D) 18

Q79 Permutations & Combinations **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/7e-F1ZfFH2](https://www.prepwiser.in/questions/7e-F1ZfFH2)Asked 2 times: 31 Aug 2021 S1, **23 Jan 2025 S1 (printed)**

The number of words, which can be formed using all the letters of the word "DAUGHTER", so that all the vowels never come together, is:

- (A) 34000 (B) 37000 (C) 35000 (D) 36000

Q80 Permutations & Combinations **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/eB-rcYCHXF](https://www.prepwiser.in/questions/eB-rcYCHXF)Asked 2 times: 6 Apr 2024 S2, **29 Jan 2025 S2 (printed)**If all the words with or without meaning made using all the letters of the word "KANPUR" are arranged as in a dictionary, then the word at 440th position in this arrangement is:

- (A) PRNAKU (B) PRKAUN (C) PRKANU (D) PRNAUK

Q81 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/6Nq2WzwOtR](https://www.prepwiser.in/questions/6Nq2WzwOtR)Asked 2 times: 30 Jan 2024 S2, **3 Apr 2025 S1 (printed)**Let a line passing through the point $(4, 1, 0)$ intersect the line $L_1 : \frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ at the point $A(\alpha, \beta, \gamma)$ and the line $L_2 : x - 6 = y = -z + 4$ at the point $B(a, b, c)$. Then $\begin{vmatrix} 1 & 0 & 1 \\ \alpha & \beta & \gamma \\ a & b & c \end{vmatrix}$ is equal to

- (A) 16 (B) 6 (C) 8 (D) 12

Q82 Circles **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/xu9KXsZ3Z6](https://www.prepwiser.in/questions/xu9KXsZ3Z6)Asked 2 times: 27 Jan 2024 S1, **3 Apr 2025 S2 (printed)**If the four distinct points $(4, 6)$, $(-1, 5)$, $(0, 0)$ and $(k, 3k)$ lie on a circle of radius r , then $10k + r^2$ is equal to

- (A) 34 (B) 32 (C) 35 (D) 33

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Q83 Applications of Derivatives **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/2p1iqny4MX](#)Asked 2 times: 27 Jun 2022 S2, **22 Jan 2025 S2 (printed)**

Let $f(x) = \int_0^{x^2} \frac{t^2 - 8t + 15}{e^t} dt$, $x \in \mathbf{R}$. Then the numbers of local maximum and local minimum points of f , respectively, are:

- (A) 3 and 2 (B) 2 and 2 (C) 2 and 3 (D) 1 and 3

Q84 Sequences & Series **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/xxkVOpXMhe](#)Asked 2 times: 13 Apr 2023 S2, **3 Apr 2025 S1 (printed)**

Let $a_1, a_2, a_3, \dots$ be a G.P. of increasing positive numbers. If $a_3 a_5 = 729$ and $a_2 + a_4 = \frac{111}{4}$, then $24(a_1 + a_2 + a_3)$ is equal to

- (A) 128 (B) 129 (C) 131 (D) 130

Q85 Binomial Theorem **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/i-m7pvC6VP](#)Asked 2 times: 13 Apr 2023 S2, **29 Jan 2025 S2 (printed)**

The remainder, when 7^{103} is divided by 23, is equal to:

- (A) 9 (B) 6 (C) 14 (D) 17

Q86 Trigonometric Equations **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/IsrMiWgspS](#)Asked 2 times: 26 Jul 2022 S2, **22 Jan 2025 S2 (printed)**

The sum of all values of $\theta \in [0, 2\pi]$ satisfying $2 \sin^2 \theta = \cos 2\theta$ and $2 \cos^2 \theta = 3 \sin \theta$ is

- (A) π (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{2}$ (D) 4π

Q87 Parabola **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/DpYlReWYR5](#)Asked 2 times: 27 Jun 2022 S2, **24 Jan 2025 S2 (printed)**

If the equation of the parabola with vertex $V\left(\frac{3}{2}, 3\right)$ and the directrix $x + 2y = 0$ is $\alpha x^2 + \beta y^2 - \gamma xy - 30x - 60y + 225 = 0$, then $\alpha + \beta + \gamma$ is equal to:

- (A) 6 (B) 8 (C) 7 (D) 9

Q88 Inverse Trigonometric Functions **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/5EOdP9i3UH](#)Asked 2 times: 3 Sep 2020 S1, **28 Jan 2025 S1 (printed)**

$\cos\left(\sin^{-1} \frac{3}{5} + \sin^{-1} \frac{5}{13} + \sin^{-1} \frac{33}{65}\right)$ is equal to:

- (A) $\frac{33}{65}$ (B) 1 (C) $\frac{32}{65}$ (D) 0

Q89 Vectors **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/UvAjUY-ZsU](#)Asked 2 times: 24 Feb 2021 S1, **24 Jan 2025 S1 (printed)**

Let $\vec{a} = \hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{b} = 3\hat{i} + \hat{j} - \hat{k}$ and $\vec{c}$ be three vectors such that $\vec{c}$ is coplanar with $\vec{a}$ and $\vec{b}$. If the vector $\vec{c}$ is perpendicular to $\vec{b}$ and $\vec{a} \cdot \vec{c} = 5$, then $|\vec{c}|$ is equal to

- (A) $\sqrt{\frac{11}{6}}$ (B) $\frac{1}{3\sqrt{2}}$ (C) 18 (D) 16

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Q90 Probability: Advanced **Asked 2×**

[Step-by-step solution](#) › [prepwisar.in/questions/14oq2XEZNR](https://www.prepwisar.in/questions/14oq2XEZNR)

Asked 2 times: 8 Apr 2023 S2, **3 Apr 2025 S2 (printed)**

If the probability that the random variable X takes the value x is given by

$P(X = x) = k(x + 1)3^{-x}$, $x = 0, 1, 2, 3, \dots$, where k is a constant, then $P(X \geq 3)$ is equal to

- (A) $\frac{1}{9}$ (B) $\frac{8}{27}$ (C) $\frac{7}{27}$ (D) $\frac{4}{9}$

Q91 Ellipse **Asked 2×**

[Step-by-step solution](#) › [prepwisar.in/questions/Kz-3mylpTW](https://www.prepwisar.in/questions/Kz-3mylpTW)

Asked 2 times: 27 Jan 2024 S1, **23 Jan 2025 S2 (printed)**

The length of the chord of the ellipse $\frac{x^2}{4} + \frac{y^2}{2} = 1$, whose mid-point is $(1, \frac{1}{2})$, is:

- (A) $\frac{2}{3}\sqrt{15}$ (B) $\frac{1}{3}\sqrt{15}$ (C) $\sqrt{15}$ (D) $\frac{5}{3}\sqrt{15}$

Q92 Statistics **Asked 2×** **NUMERICAL**

[Step-by-step solution](#) › [prepwisar.in/questions/ntENBkBoVF](https://www.prepwisar.in/questions/ntENBkBoVF)

Asked 2 times: 2 Sep 2020 S2, **23 Jan 2025 S2 (printed)**

The variance of the numbers 8, 21, 34, 47, $\dots$, 320 is _____.

Q93 Probability: Advanced **Asked 2×**

[Step-by-step solution](#) › [prepwisar.in/questions/jMtsnMAbsP](https://www.prepwisar.in/questions/jMtsnMAbsP)

Asked 2 times: 4 Apr 2024 S1, **28 Jan 2025 S2 (printed)**

Bag B_1 contains 6 white and 4 blue balls, Bag B_2 contains 4 white and 6 blue balls, and Bag B_3 contains 5 white and 5 blue balls. One of the bags is selected at random and a ball is drawn from it. If the ball is white, then the probability that the ball is drawn from Bag B_2 is:

- (A) $\frac{2}{5}$ (B) $\frac{4}{15}$ (C) $\frac{1}{3}$ (D) $\frac{2}{3}$

Q94 Ellipse **Asked 2×**

[Step-by-step solution](#) › [prepwisar.in/questions/xStvqyJR5c](https://www.prepwisar.in/questions/xStvqyJR5c)

Asked 2 times: 24 Jan 2025 S2, **29 Jan 2025 S2 (printed)**

If $\alpha x + \beta y = 109$ is the equation of the chord of the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$, whose mid point is $(\frac{5}{2}, \frac{1}{2})$, then $\alpha + \beta$ is equal to:

- (A) 37 (B) 46 (C) 72 (D) 58

Q95 Permutations & Combinations **Asked 2×**

[Step-by-step solution](#) › [prepwisar.in/questions/K7mSBfeg7K](https://www.prepwisar.in/questions/K7mSBfeg7K)

Asked 2 times: 17 Mar 2021 S2, **4 Apr 2024 S1 (printed)**

There are 5 points P_1, P_2, P_3, P_4, P_5 on the side AB , excluding A and B , of a triangle ABC . Similarly there are 6 points $P_6, P_7, \dots, P_{11}$ on the side BC and 7 points $P_{12}, P_{13}, \dots, P_{18}$ on the side CA of the triangle. The number of triangles, that can be formed using the points $P_1, P_2, \dots, P_{18}$ as vertices, is:

- (A) 751 (B) 776 (C) 796 (D) 771

Q96 Permutations & Combinations **Asked 2×** **NUMERICAL**

[Step-by-step solution](#) › [prepwisar.in/questions/Rd8m0bbVIL](https://www.prepwisar.in/questions/Rd8m0bbVIL)

Asked 2 times: 8 Jan 2020 S2, **31 Jan 2024 S1 (printed)**

The total number of words (with or without meaning) that can be formed out of the letters of the word 'DISTRIBUTION' taken four at a time, is equal to _____.

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Q97 Sets **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/wwh01Kztll](https://www.prepwise.in/questions/wwh01Kztll)Asked 2 times: 6 Sep 2020 S1, **27 Jan 2024 S2 (printed)**

Let A and B be two finite sets with m and n elements respectively. The total number of subsets of the set A is 56 more than the total number of subsets of B . Then the distance of the point $P(m, n)$ from the point $Q(-2, -3)$ is:

- (A) 8 (B) 10 (C) 4 (D) 6

Q98 Sequences & Series **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/pZCpzy3GM](https://www.prepwise.in/questions/pZCpzy3GM)Asked 2 times: 26 Feb 2021 S1, **8 Apr 2024 S2 (printed)**

In an increasing geometric progression of positive terms, the sum of the second and sixth terms is $\frac{70}{3}$ and the product of the third and fifth terms is 49. Then the sum of the 4th, 6th and 8th terms is equal to:

- (A) 78 (B) 96 (C) 91 (D) 84

Q99 Area Under Curves **Asked 2×** NUMERICAL[Step-by-step solution](#) › [prepwise.in/questions/g99-jnvZvj](https://www.prepwise.in/questions/g99-jnvZvj)Asked 2 times: 3 Sep 2020 S1, **29 Jan 2024 S2 (printed)**

Let the area of the region $\{(x, y) : 0 \leq x \leq 3, 0 \leq y \leq \min\{x^2 + 2, 2x + 2\}\}$ be A . Then $12A$ is equal to _____.

Q100 Sequences & Series **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/O6ZDP-jLgr](https://www.prepwise.in/questions/O6ZDP-jLgr)Asked 2 times: 9 Jan 2020 S2, **27 Jan 2024 S1 (printed)**

The number of common terms in the progressions

4, 9, 14, 19, ..., up to 25th term and

3, 6, 9, 12, ..., up to 37th term is:

- (A) 9 (B) 8 (C) 5 (D) 7

Q101 Vectors **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/wjQVVTfydo](https://www.prepwise.in/questions/wjQVVTfydo)Asked 2 times: 20 Jul 2021 S1, **6 Apr 2024 S2 (printed)**

Let $\vec{a} = 6\hat{i} + \hat{j} - \hat{k}$ and $\vec{b} = \hat{i} + \hat{j}$. If $\vec{c}$ is a vector such that

$$|\vec{c}| \geq 6, \vec{a} \cdot \vec{c} = 6|\vec{c}|, |\vec{c} - \vec{a}| = 2\sqrt{2}$$

and the angle between $\vec{a} \times \vec{b}$ and $\vec{c}$ is 60° , then $|(\vec{a} \times \vec{b}) \times \vec{c}|$ is equal to:

- (A) $\frac{3}{2}\sqrt{6}$ (B) $\frac{9}{2}(6 - \sqrt{6})$ (C) $\frac{9}{2}(6 + \sqrt{6})$ (D) $\frac{3}{2}\sqrt{3}$

Q102 Area Under Curves **Asked 2×**[Step-by-step solution](#) › [prepwise.in/questions/x3SEjcHE4o](https://www.prepwise.in/questions/x3SEjcHE4o)Asked 2 times: 24 Jun 2022 S2, **4 Apr 2024 S2 (printed)**

The area (in sq. units) of the region described by $\{(x, y) : y^2 \leq 2x, \text{ and } y \geq 4x - 1\}$ is

- (A) $\frac{9}{32}$ (B) $\frac{11}{12}$ (C) $\frac{8}{9}$ (D) $\frac{11}{32}$

Q103 Sequences & Series **Asked 2×** NUMERICAL[Step-by-step solution](#) › [prepwise.in/questions/cdAzRjKSWY](https://www.prepwise.in/questions/cdAzRjKSWY)Asked 2 times: 29 Jun 2022 S2, **1 Feb 2024 S1 (printed)**

Let 3, 7, 11, 15, . . . , 403 and 2, 5, 8, 11, . . . , 404 be two arithmetic progressions. Then the sum, of the common terms in them, is equal to _____.

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Q104 Functions (Advanced) **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/VBuKSEvePk](https://www.prepwisar.in/questions/VBuKSEvePk)Asked 2 times: 25 Jun 2022 S1, **4 Apr 2024 S1 (printed)**

Let $f(x) = x^5 + 2e^{x/4}$ for all $x \in \mathbf{R}$. Consider a function $g(x)$ such that $(g \circ f)(x) = x$ for all $x \in \mathbf{R}$. Then the value of $8g'(2)$ is:

- (A) 4 (B) 2 (C) 16 (D) 8

Q105 Binomial Theorem **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/VVWH0-oOhY](https://www.prepwisar.in/questions/VVWH0-oOhY)Asked 2 times: 1 Feb 2023 S2, **8 Apr 2024 S2 (printed)**

If the term independent of x in the expansion of $(\sqrt{a}x^2 + \frac{1}{2x^3})^{10}$ is 105, then a^2 is equal to:

- (A) 6 (B) 4 (C) 2 (D) 9

Q106 Differential Equations **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/2aTu29pPx_](https://www.prepwisar.in/questions/2aTu29pPx_)Asked 2 times: 29 Jan 2023 S2, **6 Apr 2024 S1 (printed)**

Let $y = y(x)$ be the solution of the differential equation $(2x \log_e x) \frac{dy}{dx} + 2y = \frac{3}{x} \log_e x$, $x > 0$ and $y(e^{-1}) = 0$. Then, $y(e)$ is equal to

- (A) $-\frac{3}{e}$ (B) $-\frac{3}{2e}$ (C) $-\frac{2}{3e}$ (D) $-\frac{2}{e}$

Q107 Three Dimensional Geometry **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwisar.in/questions/0KPK1j0aB9](https://www.prepwisar.in/questions/0KPK1j0aB9)Asked 2 times: 3 Sep 2020 S1, **6 Apr 2024 S1 (printed)**

Let P be the point $(10, -2, -1)$ and Q be the foot of the perpendicular drawn from the point $R(1, 7, 6)$ on the line passing through the points $(2, -5, 11)$ and $(-6, 7, -5)$. Then the length of the line segment PQ is equal to _____.

Q108 Limits **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/zUJKQ8gMnP](https://www.prepwisar.in/questions/zUJKQ8gMnP)Asked 2 times: 29 Jan 2024 S1, **9 Apr 2024 S2 (printed)**

$$\lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{\int_{x^3}^{(\pi/2)^3} (\sin(2t^{1/3}) + \cos(t^{1/3})) dt}{(x - \frac{\pi}{2})^2} \right)$$

is equal to

- (A) $\frac{3\pi^2}{2}$ (B) $\frac{9\pi^2}{8}$ (C) $\frac{5\pi^2}{9}$ (D) $\frac{11\pi^2}{10}$

Q109 Vectors **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwisar.in/questions/yIShmepwq_](https://www.prepwisar.in/questions/yIShmepwq_)Asked 2 times: 30 Jan 2024 S1, **31 Jan 2024 S1 (printed)**

Let $\vec{a}$ and $\vec{b}$ be two vectors such that $|\vec{a}| = 1$, $|\vec{b}| = 4$, and $\vec{a} \cdot \vec{b} = 2$. If $\vec{c} = (2\vec{a} \times \vec{b}) - 3\vec{b}$ and the angle between $\vec{b}$ and $\vec{c}$ is α , then $192 \sin^2 \alpha$ is equal to _____.

Q110 Straight Lines **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/ZQShejNARx](https://www.prepwisar.in/questions/ZQShejNARx)Asked 2 times: 31 Jan 2024 S2, **6 Apr 2024 S1 (printed)**

Let a variable line of slope $m > 0$ passing through the point $(4, -9)$ intersect the coordinate axes at the points A and B . The minimum value of the sum of the distances of A and B from the origin is

- (A) 30 (B) 15 (C) 10 (D) 25

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Q111 Vectors **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/tdtSV-1NhI](https://www.prepwiser.in/questions/tdtSV-1NhI)Asked 2 times: 5 Apr 2024 S1, **6 Apr 2024 S1 (printed)**

If $A(3, 1, -1)$, $B(\frac{5}{3}, \frac{7}{3}, \frac{1}{3})$, $C(2, 2, 1)$ and $D(\frac{10}{3}, \frac{2}{3}, \frac{-1}{3})$ are the vertices of a quadrilateral $ABCD$, then its area is

- (A) $\frac{4\sqrt{2}}{3}$ (B) $\frac{2\sqrt{2}}{3}$ (C) $\frac{5\sqrt{2}}{3}$ (D) $2\sqrt{2}$

Q112 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/hM2yGzZ5zI](https://www.prepwiser.in/questions/hM2yGzZ5zI)Asked 2 times: 27 Jan 2024 S2, **4 Apr 2024 S2 (printed)**

Let P be the point of intersection of the lines $\frac{x-2}{1} = \frac{y-4}{5} = \frac{z-2}{1}$ and $\frac{x-3}{2} = \frac{y-2}{3} = \frac{z-3}{2}$. Then, the shortest distance of P from the line $4x = 2y = z$ is

- (A) $\frac{3\sqrt{14}}{7}$ (B) $\frac{5\sqrt{14}}{7}$ (C) $\frac{\sqrt{14}}{7}$ (D) $\frac{6\sqrt{14}}{7}$

Q113 Vectors **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/uRqchUBF-d](https://www.prepwiser.in/questions/uRqchUBF-d)Asked 2 times: 29 Jan 2024 S2, **9 Apr 2024 S1 (printed)**

Let $\vec{OA} = 2\vec{a}$, $\vec{OB} = 6\vec{a} + 5\vec{b}$ and $\vec{OC} = 3\vec{b}$, where O is the origin. If the area of the parallelogram with adjacent sides $\vec{OA}$ and $\vec{OC}$ is 15 sq. units, then the area (in sq. units) of the quadrilateral $OABC$ is equal to:

- (A) 32 (B) 38 (C) 35 (D) 40

Q114 Probability: Advanced **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/7OFb2Vm_hQ](https://www.prepwiser.in/questions/7OFb2Vm_hQ)Asked 2 times: 29 Jul 2022 S2, **1 Feb 2023 S1 (printed)**

In a binomial distribution $B(n, p)$, the sum and the product of the mean and the variance are 5 and 6 respectively, then $6(n + p - q)$ is equal to:

- (A) 52 (B) 50 (C) 51 (D) 53

Q115 Differential Equations **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/DgvSkfK_jI](https://www.prepwiser.in/questions/DgvSkfK_jI)Asked 2 times: 1 Sep 2021 S2, **24 Jan 2023 S1 (printed)**

Let $y = y(x)$ be the solution of the differential equation $x^3 dy + (xy - 1)dx = 0$, $x > 0$, $y(\frac{1}{2}) = 3 - e$. Then $y(1)$ is equal to

- (A) $2 - e$ (B) 3 (C) 1 (D) e

Q116 Vectors **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/xycc5HbiYw](https://www.prepwiser.in/questions/xycc5HbiYw)Asked 2 times: 25 Jul 2021 S2, **31 Jan 2023 S1 (printed)**

Let $\vec{a}$ and $\vec{b}$ be two vectors such that $|\vec{a}| = \sqrt{14}$, $|\vec{b}| = \sqrt{6}$ and $|\vec{a} \times \vec{b}| = \sqrt{48}$. Then $(\vec{a} \cdot \vec{b})^2$ is equal to _____.

Q117 Relations & Functions (Basic) **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/t3JHpEo2R8](https://www.prepwiser.in/questions/t3JHpEo2R8)Asked 2 times: 25 Jul 2022 S1, **11 Apr 2023 S2 (printed)**

Let $A = \{1, 2, 3, 4, 5\}$ and $B = \{1, 2, 3, 4, 5, 6\}$. Then the number of functions $f : A \rightarrow B$ satisfying $f(1) + f(2) = f(4) - 1$ is equal to _____.

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Q118 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/PQ1ePj5PsE](https://www.prepwisar.in/questions/PQ1ePj5PsE)Asked 2 times: 25 Jul 2022 S2, **25 Jan 2023 S2 (printed)**The shortest distance between the lines $x + 1 = 2y = -12z$ and $x = y + 2 = 6z - 6$ is:

- (A) 3 (B) $\frac{5}{2}$ (C) $\frac{3}{2}$ (D) 2

Q119 Binomial Theorem **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/cs5mN_vXex](https://www.prepwisar.in/questions/cs5mN_vXex)Asked 2 times: 4 Sep 2020 S2, **8 Apr 2023 S1 (printed)**If the coefficients of three consecutive terms in the expansion of $(1 + x)^n$ are in the ratio 1 : 5 : 20, then the coefficient of the fourth term is

- (A) 3654 (B) 1827 (C) 5481 (D) 2436

Q120 Binomial Theorem **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/UV8r9YJcom](https://www.prepwisar.in/questions/UV8r9YJcom)Asked 2 times: 26 Aug 2021 S1, **24 Jan 2023 S1 (printed)**

Suppose

$$\sum_{r=0}^{2023} r^{2023} C_r = 2023 \times \alpha \times 2^{2022}$$

. Then the value of α is _____**Q121** Complex Numbers **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/qq4WMCh0IU](https://www.prepwisar.in/questions/qq4WMCh0IU)Asked 2 times: 2 Sep 2020 S1, **24 Jan 2023 S2 (printed)**

The value of

$$\left(\frac{1 + \sin \frac{2\pi}{9} + i \cos \frac{2\pi}{9}}{1 + \sin \frac{2\pi}{9} - i \cos \frac{2\pi}{9}} \right)^3$$

is

- (A) $-\frac{1}{2} (1 - i\sqrt{3})$ (B) $-\frac{1}{2} (\sqrt{3} - i)$ (C) $\frac{1}{2} (1 - i\sqrt{3})$ (D) $\frac{1}{2} (\sqrt{3} + i)$

Q122 Vectors **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/cKiKOVUxnH](https://www.prepwisar.in/questions/cKiKOVUxnH)Asked 2 times: 26 Jul 2022 S2, **11 Apr 2023 S1 (printed)**Let $\vec{a}$ be a non-zero vector parallel to the line of intersection of the two planes described by $\hat{i} + \hat{j}, \hat{i} + \hat{k}$ and $\hat{i} - \hat{j}, \hat{j} - \hat{k}$. If θ is the angle between the vector $\vec{a}$ and the vector $\vec{b} = 2\hat{i} - 2\hat{j} + \hat{k}$ and $\vec{a} \cdot \vec{b} = 6$, then the ordered pair $(\theta, |\vec{a} \times \vec{b}|)$ is equal to:

- (A) $(\frac{\pi}{3}, 3\sqrt{6})$ (B) $(\frac{\pi}{3}, 6)$ (C) $(\frac{\pi}{4}, 3\sqrt{6})$ (D) $(\frac{\pi}{4}, 6)$

Q123 Definite Integration **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/oKfwKKEUht](https://www.prepwisar.in/questions/oKfwKKEUht)Asked 2 times: 25 Feb 2021 S2, **24 Jan 2023 S1 (printed)**The value of $12 \int_0^3 |x^2 - 3x + 2| dx$ is _____**Q124** Functions (Advanced) **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/PDJ9_LCD_x](https://www.prepwisar.in/questions/PDJ9_LCD_x)Asked 2 times: 6 Sep 2020 S2, **24 Jan 2023 S2 (printed)**Let $f(x)$ be a function such that $f(x + y) = f(x) \cdot f(y)$ for all $x, y \in \mathbb{N}$. If $f(1) = 3$ and $\sum_{k=1}^n f(k) = 3279$, then the value of n is

- (A) 9 (B) 7 (C) 6 (D) 8

Q125 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/HkKsf_K-il](#)Asked 2 times: 27 Jun 2022 S2, **13 Apr 2023 S2 (printed)**

Let N be the foot of perpendicular from the point $P(1, -2, 3)$ on the line passing through the points $(4, 5, 8)$ and $(1, -7, 5)$. Then the distance of N from the plane $2x - 2y + z + 5 = 0$ is:

- (A) 7 (B) 6 (C) 9 (D) 8

Q126 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/RH6mXUtYFv](#)Asked 2 times: 26 Jun 2022 S2, **12 Apr 2023 S1 (printed)**

Let the plane $P: 4x - y + z = 10$ be rotated by an angle $\frac{\pi}{2}$ about its line of intersection with the plane $x + y - z = 4$. If α is the distance of the point $(2, 3, -4)$ from the new position of the plane P , then 35α is equal to:

- (A) 126 (B) 105 (C) 85 (D) 90

Q127 Applications of Derivatives **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/GsI3RchZ0c](#)Asked 2 times: 26 Jun 2022 S1, **1 Feb 2023 S2 (printed)**

The sum of the absolute maximum and minimum values of the function $f(x) = |x^2 - 5x + 6| - 3x + 2$ in the interval $[-1, 3]$ is equal to:

- (A) 13 (B) 24 (C) 10 (D) 12

Q128 Relations & Functions (Basic) **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/0DK8EMVTKX](#)Asked 2 times: 6 Sep 2020 S1, **13 Apr 2023 S1 (printed)**

Fractional part of the number $\frac{4^{2022}}{15}$ is equal to

- (A) $\frac{8}{15}$ (B) $\frac{4}{15}$ (C) $\frac{1}{15}$ (D) $\frac{14}{15}$

Q129 Matrices **Asked 2×**[Step-by-step solution](#) › [prepwisar.in/questions/JQIZX3IWA1](#)Asked 2 times: 26 Aug 2021 S1, **25 Jan 2023 S2 (printed)**

Let

$$A = \begin{bmatrix} \frac{1}{\sqrt{10}} & \frac{3}{\sqrt{10}} \\ \frac{-3}{\sqrt{10}} & \frac{1}{\sqrt{10}} \end{bmatrix}$$

and $B = \begin{bmatrix} 1 & -i \\ 0 & 1 \end{bmatrix}$, where $i = \sqrt{-1}$. If $M = A^T B A$, then the inverse of the matrix $A M^{2023} A^T$ is

- (A) $\begin{bmatrix} 1 & -2023i \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 2023i & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 2023i \\ 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ -2023i & 1 \end{bmatrix}$

Q130 Permutations & Combinations **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwisar.in/questions/BX2ET1hqm6](#)Asked 2 times: 18 Mar 2021 S1, **10 Apr 2023 S2 (printed)**

The sum of all the four-digit numbers that can be formed using all the digits 2, 1, 2, 3 is equal to _____.

Q131 Circles **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwisar.in/questions/Egg-E4-ua5](#)Asked 2 times: 29 Jul 2022 S1, **8 Apr 2023 S1 (printed)**

Consider a circle $C_1: x^2 + y^2 - 4x - 2y = \alpha - 5$. Let its mirror image in the line $y = 2x + 1$ be another circle $C_2: 5x^2 + 5y^2 - 10fx - 10gy + 36 = 0$. Let r be the radius of C_2 . Then $\alpha + r$ is equal to _____.

Q132 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/tH751Cj6xo](https://www.prepwiser.in/questions/tH751Cj6xo)Asked 2 times: 27 Aug 2021 S2, **6 Apr 2023 S1 (printed)**

If the equation of the plane passing through the line of intersection of the planes $2x - y + z = 3$, $4x - 3y + 5z + 9 = 0$ and parallel to the line $\frac{x+1}{-2} = \frac{y+3}{4} = \frac{z-2}{5}$ is $ax + by + cz + 6 = 0$, then $a + b + c$ is equal to:

(A) 13**(B)** 15**(C)** 14**(D)** 12**Q133** Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/6BxeCiLPBs](https://www.prepwiser.in/questions/6BxeCiLPBs)Asked 2 times: 2 Sep 2020 S1, **13 Apr 2023 S2 (printed)**

The plane, passing through the points $(0, -1, 2)$ and $(-1, 2, 1)$ and parallel to the line passing through $(5, 1, -7)$ and $(1, -1, -1)$, also passes through the point:

(A) $(0, 5, -2)$ **(B)** $(2, 0, 1)$ **(C)** $(1, -2, 1)$ **(D)** $(-2, 5, 0)$ **Q134** Vectors **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/NVzdFFH7TO](https://www.prepwiser.in/questions/NVzdFFH7TO)Asked 2 times: 25 Jan 2023 S2, **6 Apr 2023 S2 (printed)**

The sum of all values of α , for which the points whose position vectors are

$$\hat{i} - 2\hat{j} + 3\hat{k}, 2\hat{i} - 3\hat{j} + 4\hat{k}, (\alpha + 1)\hat{i} + 2\hat{k}$$

and $9\hat{i} + (\alpha - 8)\hat{j} + 6\hat{k}$ are coplanar, is equal to:

(A) 6**(B)** 4**(C)** -2**(D)** 2**Q135** Ellipse **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/DYGI4aDTxv](https://www.prepwiser.in/questions/DYGI4aDTxv)Asked 2 times: 24 Jan 2023 S1, **11 Apr 2023 S2 (printed)**

If the radius of the largest circle with centre $(2, 0)$ inscribed in the ellipse $x^2 + 4y^2 = 36$ is r , then $12r^2$ is equal to:

(A) 72**(B)** 92**(C)** 115**(D)** 69**Q136** Determinants **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/a49XREILvT](https://www.prepwiser.in/questions/a49XREILvT)Asked 2 times: 10 Apr 2023 S1, **13 Apr 2023 S1 (printed)**

For the system of linear equations

$$2x + 4y + 2az = b$$

$$x + 2y + 3z = 4$$

$$2x - 5y + 2z = 8$$

which of the following is NOT correct?

(A) It has infinitely many solutions if $a = 3, b = 8$ **(B)** It has infinitely many solutions if $a = 3, b = 6$ **(C)** It has unique solution if $a = b = 8$ **(D)** It has unique solution if $a = b = 6$ **Q137** Differential Equations **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/Dzj23uaxxb](https://www.prepwiser.in/questions/Dzj23uaxxb)Asked 2 times: 16 Mar 2021 S1, **26 Jul 2022 S1 (printed)**

If $\frac{dy}{dx} + 2y \tan x = \sin x$, $0 < x < \frac{\pi}{2}$ and $y\left(\frac{\pi}{3}\right) = 0$, then the maximum value of $y(x)$ is:

(A) $\frac{1}{8}$ **(B)** $\frac{3}{4}$ **(C)** $\frac{1}{4}$ **(D)** $\frac{3}{8}$

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Q138 Inverse Trigonometric Functions **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/PcYduYJzvA](https://www.prepwiser.in/questions/PcYduYJzvA)Asked 2 times: 5 Sep 2020 S1, **27 Jun 2022 S2 (printed)**

The value of

$$\cot \left(\sum_{n=1}^{50} \tan^{-1} \left(\frac{1}{1+n+n^2} \right) \right)$$

is:

- (A) $\frac{26}{25}$ (B) $\frac{25}{26}$ (C) $\frac{50}{51}$ (D) $\frac{52}{51}$

Q139 Determinants **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/6tA7-Lnkm4](https://www.prepwiser.in/questions/6tA7-Lnkm4)Asked 2 times: 2 Sep 2020 S1, **24 Jun 2022 S1 (printed)**The number of values of α for which the system of equations:

$$x + y + z = \alpha$$

$$\alpha x + 2\alpha y + 3z = -1$$

$$x + 3\alpha y + 5z = 4$$

is inconsistent, is

- (A) 0 (B) 1 (C) 2 (D) 3

Q140 Limits **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/CqXznONKeB](https://www.prepwiser.in/questions/CqXznONKeB)Asked 2 times: 27 Aug 2021 S2, **25 Jul 2022 S1 (printed)**

If

$$\lim_{n \rightarrow \infty} \left(\sqrt{n^2 - n - 1} + n\alpha + \beta \right) = 0$$

, then $8(\alpha + \beta)$ is equal to:

- (A) 4 (B) -8 (C) -4 (D) 8

Q141 Quadratic Equations & Polynomial Inequalities **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/cFMLkwZ-A2](https://www.prepwiser.in/questions/cFMLkwZ-A2)Asked 2 times: 9 Jan 2020 S2, **25 Jun 2022 S2 (printed)**

Let $a, b \in \mathbb{R}$ be such that the equation $ax^2 - 2bx + 15 = 0$ has a repeated root α . If α and β are the roots of the equation $x^2 - 2bx + 21 = 0$, then $\alpha^2 + \beta^2$ is equal to:

- (A) 37 (B) 58 (C) 68 (D) 92

Q142 Limits **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/5b8rgnk4Sv](https://www.prepwiser.in/questions/5b8rgnk4Sv)Asked 2 times: 25 Feb 2021 S2, **26 Jul 2022 S2 (printed)**

Let

$$\beta = \lim_{x \rightarrow 0} \frac{\alpha x - (e^{3x} - 1)}{\alpha x (e^{3x} - 1)}$$

for some $\alpha \in \mathbb{R}$. Then the value of $\alpha + \beta$ is:

- (A) $\frac{14}{5}$ (B) $\frac{3}{2}$ (C) $\frac{5}{2}$ (D) $\frac{7}{2}$

Q143 Binomial Theorem **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/ONTxsWiAxs](https://www.prepwiser.in/questions/ONTxsWiAxs)Asked 2 times: 17 Mar 2021 S1, **26 Jun 2022 S1 (printed)**The remainder when $(2021)^{2023}$ is divided by 7 is:

- (A) 1 (B) 2 (C) 5 (D) 6

Q144 Sets **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/jZhZjbp3oF](https://www.prepwiser.in/questions/jZhZjbp3oF)Asked 2 times: 9 Jan 2020 S2, **25 Jun 2022 S2 (printed)**

Let $A = \{x \in R : |x + 1| < 2\}$ and $B = \{x \in R : |x - 1| \geq 2\}$. Then which one of the following statements is NOT true?

(A) $A - B = (-1, 1)$

(B) $B - A = R - (-3, 1)$

(C) $A \cap B = (-3, -1]$

(D) $A \cup B = R - [1, 3)$

Q145 Limits **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/SI0wTVuHL5](https://www.prepwiser.in/questions/SI0wTVuHL5)Asked 2 times: 17 Mar 2021 S1, **26 Jun 2022 S2 (printed)**

$\lim_{x \rightarrow 0} \frac{\cos(\sin x) - \cos x}{x^4}$ is equal to:

(A) $\frac{1}{3}$

(B) $\frac{1}{4}$

(C) $\frac{1}{6}$

(D) $\frac{1}{12}$

Q146 Binomial Theorem **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwiser.in/questions/o-50zzII0a](https://www.prepwiser.in/questions/o-50zzII0a)Asked 2 times: 26 Feb 2021 S1, **25 Jul 2022 S1 (printed)**

If the maximum value of the term independent of t in the expansion of

$$\left(t^2 x^{\frac{1}{5}} + \frac{(1-x)^{\frac{1}{10}}}{t} \right)^{15}, x \geq 0$$

, is K , then $8K$ is equal to _____.

Q147 Definite Integration **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/CO4ndtnjie](https://www.prepwiser.in/questions/CO4ndtnjie)Asked 2 times: 24 Feb 2021 S2, **28 Jun 2022 S1 (printed)**

Let $[t]$ denote the greatest integer less than or equal to t . Then, the value of the integral

$\int_0^1 [-8x^2 + 6x - 1] dx$ is equal to:

(A) -1

(B) $-\frac{5}{4}$

(C) $\frac{\sqrt{17} - 13}{8}$

(D) $\frac{\sqrt{17} - 16}{8}$

Q148 Quadratic Equations & Polynomial Inequalities **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/g4uAoE6oDM](https://www.prepwiser.in/questions/g4uAoE6oDM)Asked 2 times: 2 Sep 2020 S2, **28 Jun 2022 S2 (printed)**

Let $f(x)$ be a quadratic polynomial such that $f(-2) + f(3) = 0$. If one of the roots of $f(x) = 0$ is -1 , then the sum of the roots of $f(x) = 0$ is equal to:

(A) $\frac{11}{3}$

(B) $\frac{7}{3}$

(C) $\frac{13}{3}$

(D) $\frac{14}{3}$

Q149 Vectors **Asked 2×**[Step-by-step solution](#) > [prepwiser.in/questions/R8RR28Ms2e](https://www.prepwiser.in/questions/R8RR28Ms2e)Asked 2 times: 26 Feb 2021 S1, **29 Jul 2022 S2 (printed)**

If $(2, 3, 9)$, $(5, 2, 1)$, $(1, \lambda, 8)$ and $(\lambda, 2, 3)$ are coplanar, then the product of all possible values of λ is:

(A) $\frac{21}{2}$

(B) $\frac{59}{8}$

(C) $\frac{57}{8}$

(D) $\frac{95}{8}$

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Q150 Definite Integration **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/2vIbet46yq](https://www.prepwisar.in/questions/2vIbet46yq)Asked 2 times: 26 Feb 2021 S2, **29 Jul 2022 S1 (printed)**

If

$$f(\alpha) = \int_1^{\alpha} \frac{\log_{10} t}{1+t} dt, \alpha > 0$$

, then $f(e^3) + f(e^{-3})$ is equal to:

- (A) 9 (B) $\frac{9}{2}$ (C) $\frac{9}{\log_e(10)}$ (D) $\frac{9}{2\log_e(10)}$

Q151 Definite Integration **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/6LAgAy6hp2](https://www.prepwisar.in/questions/6LAgAy6hp2)Asked 2 times: 16 Mar 2021 S1, **28 Jun 2022 S2 (printed)**

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a continuous function satisfying $f(x) + f(x+k) = n$, for all $x \in \mathbb{R}$ where $k > 0$ and n is a positive integer. If $I_1 = \int_0^{4nk} f(x) dx$ and $I_2 = \int_{-k}^{3k} f(x) dx$, then:

- (A) $I_1 + 2I_2 = 4nk$ (B) $I_1 + 2I_2 = 2nk$ (C) $I_1 + nI_2 = 4n^2k$ (D) $I_1 + nI_2 = 6n^2k$

Q152 Circles **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/825n8YaqCH](https://www.prepwisar.in/questions/825n8YaqCH)Asked 2 times: 6 Sep 2020 S2, **24 Jun 2022 S1 (printed)**

Let $x^2 + y^2 + Ax + By + C = 0$ be a circle passing through $(0, 6)$ and touching the parabola $y = x^2$ at $(2, 4)$. Then $A + C$ is equal to _____.

- (A) 16 (B) $88/5$ (C) 72 (D) -8

Q153 Ellipse **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/9pDOQIuAqi](https://www.prepwisar.in/questions/9pDOQIuAqi)Asked 2 times: 26 Feb 2021 S2, **26 Jun 2022 S2 (printed)**

If m is the slope of a common tangent to the curves $\frac{x^2}{16} + \frac{y^2}{9} = 1$ and $x^2 + y^2 = 12$, then $12m^2$ is equal to:

- (A) 6 (B) 9 (C) 10 (D) 12

Q154 Quadratic Equations & Polynomial Inequalities **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/VWG5tMiRc9](https://www.prepwisar.in/questions/VWG5tMiRc9)Asked 2 times: 24 Feb 2021 S1, **26 Jun 2022 S2 (printed)**

Let p and q be two real numbers such that $p + q = 3$ and $p^4 + q^4 = 369$. Then $\left(\frac{1}{p} + \frac{1}{q}\right)^{-2}$ is equal to _____.

Q155 Applications of Derivatives **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/nyFKIIFHc](https://www.prepwisar.in/questions/nyFKIIFHc)Asked 2 times: 27 Aug 2021 S1, **24 Jun 2022 S2 (printed)**

The number of distinct real roots of the equation $x^7 - 7x - 2 = 0$ is

- (A) 5 (B) 7 (C) 1 (D) 3

Q156 Circles **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/DKCbTQWP5J](https://www.prepwisar.in/questions/DKCbTQWP5J)Asked 2 times: 24 Feb 2021 S1, **28 Jun 2022 S2 (printed)**

If one of the diameters of the circle $x^2 + y^2 - 2\sqrt{2}x - 6\sqrt{2}y + 14 = 0$ is a chord of the circle $(x - 2\sqrt{2})^2 + (y - 2\sqrt{2})^2 = r^2$, then the value of r^2 is equal to _____.

Q157 Probability: Advanced **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/wk_hv6zmg3](#)Asked 2 times: 27 Aug 2021 S2, **24 Jun 2022 S2 (printed)**A random variable X has the following probability distribution:

X	0	1	2	3	4
$P(X)$	k	$2k$	$4k$	$6k$	$8k$

The value of $P(1 < X < 4 \mid X \leq 2)$ is equal to:

- (A) $\frac{4}{7}$ (B) $\frac{2}{3}$ (C) $\frac{3}{7}$ (D) $\frac{4}{5}$

Q158 Matrices **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/kbH7ZKEKYO](#)Asked 2 times: 8 Jan 2020 S1, **27 Jul 2022 S1 (printed)**Let S be the set containing all 3×3 matrices with entries from $\{-1, 0, 1\}$. The total number of matrices $A \in S$ such that the sum of all the diagonal elements of $A^T A$ is 6 is _____.**Q159** Inverse Trigonometric Functions **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/UX94D_ej-c](#)Asked 2 times: 24 Feb 2021 S1, **28 Jun 2022 S2 (printed)**

The value of

$$\lim_{n \rightarrow \infty} 6 \tan \left\{ \sum_{r=1}^n \tan^{-1} \left(\frac{1}{r^2 + 3r + 3} \right) \right\}$$

is equal to:

- (A) 1 (B) 2 (C) 3 (D) 6

Q160 Applications of Derivatives **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/kOeNsZXk05](#)Asked 2 times: 25 Jun 2022 S2, **27 Jul 2022 S2 (printed)**A water tank has the shape of a right circular cone with axis vertical and vertex downwards. Its semi-vertical angle is $\tan^{-1} \frac{3}{4}$. Water is poured in it at a constant rate of 6 cubic meter per hour. The rate (in square meter per hour), at which the wet curved surface area of the tank is increasing, when the depth of water in the tank is 4 meters, is _____.**Q161** Area Under Curves **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/UxxvYtWLjZ](#)Asked 2 times: 26 Jun 2022 S1, **26 Jul 2022 S2 (printed)**The area bounded by the curves $y = |x^2 - 1|$ and $y = 1$ is

- (A) $\frac{2}{3}(\sqrt{2} + 1)$ (B) $\frac{4}{3}(\sqrt{2} - 1)$ (C) $2(\sqrt{2} - 1)$ (D) $\frac{8}{3}(\sqrt{2} - 1)$

Q162 Quadratic Equations & Polynomial Inequalities **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/hUU0YJ_OvQ](#)Asked 2 times: 4 Sep 2020 S2, **26 Aug 2021 S2 (printed)**Let $\lambda \neq 0$ be in $\mathbb{R}$. If α and β are the roots of the equation $x^2 - x + 2\lambda = 0$, and α and γ are the roots of equation $3x^2 - 10x + 27\lambda = 0$, then $\frac{\beta\gamma}{\lambda}$ is equal to _____.**Q163** Applications of Derivatives **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/Ncls9izpMJ](#)Asked 2 times: 8 Jan 2020 S2, **31 Aug 2021 S2 (printed)**Let $f(x)$ be a cubic polynomial with $f(1) = -10$, $f(-1) = 6$, and has a local minima at $x = 1$, and $f'(x)$ has a local minima at $x = -1$. Then $f(3)$ is equal to _____.Practise these online with step-by-step solutions › [prepwiser.in/learn](#)

Q164 Sequences & Series **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/NzB9ENVtul](https://www.prepwisar.in/questions/NzB9ENVtul)Asked 2 times: 5 Sep 2020 S2, **20 Jul 2021 S2 (printed)**

If sum of the first 21 terms of the series $\log_{9^{1/2}} x + \log_{9^{1/3}} x + \log_{9^{1/4}} x + \dots$, where $x > 0$ is 504, then x is equal to

- (A) 243 (B) 9 (C) 7 (D) 81

Q165 Complex Numbers **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/SkRB1rUryF](https://www.prepwisar.in/questions/SkRB1rUryF)Asked 2 times: 3 Sep 2020 S2, **27 Aug 2021 S2 (printed)**

Let z_1 and z_2 be two complex numbers such that $\arg(z_1 - z_2) = \frac{\pi}{4}$ and z_1, z_2 satisfy the equation $|z - 3| = \operatorname{Re}(z)$. Then the imaginary part of $z_1 + z_2$ is equal to _____.

Q166 Three Dimensional Geometry **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/st8MkYD4up](https://www.prepwisar.in/questions/st8MkYD4up)Asked 2 times: 24 Feb 2021 S1, **31 Aug 2021 S1 (printed)**

The square of the distance of the point of intersection of the line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z+1}{6}$ and the plane $2x - y + z = 6$ from the point $(-1, -1, 2)$ is _____.

Q167 Vectors **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/oMWabdGIfF](https://www.prepwisar.in/questions/oMWabdGIfF)Asked 2 times: 17 Mar 2021 S2, **1 Sep 2021 S2 (printed)**

Let $\vec{a} = 2\hat{i} - \hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - \hat{k}$. Let a vector $\vec{v}$ be in the plane containing $\vec{a}$ and $\vec{b}$. If $\vec{v}$ is perpendicular to the vector $3\hat{i} + 2\hat{j} - \hat{k}$ and its projection on $\vec{a}$ is 19 units, then $|2\vec{v}|^2$ is equal to _____.

Q168 Three Dimensional Geometry **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/z_utbz3HjO](https://www.prepwisar.in/questions/z_utbz3HjO)Asked 2 times: 26 Feb 2021 S2, **22 Jul 2021 S2 (printed)**

Let L be the line of intersection of planes $\vec{r} \cdot (\hat{i} - \hat{j} + 2\hat{k}) = 2$ and $\vec{r} \cdot (2\hat{i} + \hat{j} - \hat{k}) = 2$. If $P(\alpha, \beta, \gamma)$ is the foot of perpendicular on L from the point $(1, 2, 0)$, then the value of $35(\alpha + \beta + \gamma)$ is equal to:

- (A) 101 (B) 119 (C) 143 (D) 134

Q169 Vectors **Asked 2×** **NUMERICAL**[Step-by-step solution](#) > [prepwisar.in/questions/ackzj_aPjr](https://www.prepwisar.in/questions/ackzj_aPjr)Asked 2 times: 17 Mar 2021 S1, **27 Jul 2021 S2 (printed)**

Let $\vec{a} = \hat{i} - \alpha\hat{j} + \beta\hat{k}$, $\vec{b} = 3\hat{i} + \beta\hat{j} - \alpha\hat{k}$ and $\vec{c} = -\alpha\hat{i} - 2\hat{j} + \hat{k}$, where α and β are integers. If $\vec{a} \cdot \vec{b} = -1$ and $\vec{b} \cdot \vec{c} = 10$, then

$$(\vec{a} \times \vec{b}) \cdot \vec{c}$$

is equal to _____.

Q170 Vectors **Asked 2×**[Step-by-step solution](#) > [prepwisar.in/questions/5ss6Th0djt](https://www.prepwisar.in/questions/5ss6Th0djt)Asked 2 times: 18 Mar 2021 S2, **20 Jul 2021 S2 (printed)**

In a triangle ABC , if $|\vec{BC}| = 3$, $|\vec{CA}| = 5$ and $|\vec{BA}| = 7$, then the projection of the vector $\vec{BA}$ on $\vec{BC}$ is equal to:

- (A) $\frac{19}{2}$ (B) $\frac{13}{2}$ (C) $\frac{11}{2}$ (D) $\frac{15}{2}$

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Q171 Complex Numbers **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/80gQ5tDwCk](https://www.prepwiser.in/questions/80gQ5tDwCk)Asked 2 times: 26 Feb 2021 S2, **27 Jul 2021 S2 (printed)**Let C be the set of all complex numbers. Let

$$S_1 = \{z \in C : |z - 2| \leq 1\} \text{ and}$$

$$S_2 = \{z \in C : z(1 + i) + \bar{z}(1 - i) \geq 4\}.$$

Then, the maximum value of $\left|z - \frac{5}{2}\right|^2$ for $z \in S_1 \cap S_2$ is equal to:

(A) $\frac{3 + 2\sqrt{2}}{4}$

(B) $\frac{5 + 2\sqrt{2}}{2}$

(C) $\frac{3 + 2\sqrt{2}}{2}$

(D) $\frac{5 + 2\sqrt{2}}{4}$

Q172 Probability: Advanced **Asked 2×** **NUMERICAL**[Step-by-step solution](#) › [prepwiser.in/questions/F-kA1x68jI](https://www.prepwiser.in/questions/F-kA1x68jI)Asked 2 times: 24 Feb 2021 S1, **17 Mar 2021 S1 (printed)**

Let there be three independent events E_1 , E_2 and E_3 . The probability that only E_1 occurs is α , only E_2 occurs is β and only E_3 occurs is γ . Let 'p' denote the probability of none of events occurs that satisfies the equations

$$(\alpha - 2\beta)p = \alpha\beta \text{ and } (\beta - 3\gamma)p = 2\beta\gamma. \text{ All the given probabilities are assumed to lie in the interval } (0, 1).$$

Then,

$$\frac{\text{Probability of occurrence of } E_1}{\text{Probability of occurrence of } E_3}$$

is equal to _____.

Q173 Binomial Theorem **Asked 2×**[Step-by-step solution](#) › [prepwiser.in/questions/Q7_FsUTk4-](https://www.prepwiser.in/questions/Q7_FsUTk4-)Asked 2 times: 17 Mar 2021 S2, **27 Aug 2021 S1 (printed)**

$$\sum_{k=0}^{20} \binom{20}{k}^2 \text{ is equal to:}$$

(A) ${}^{40}C_{21}$

(B) ${}^{40}C_{19}$

(C) ${}^{40}C_{20}$

(D) ${}^{41}C_{20}$

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1. C	2. A	3. C	4. C	5. C	6. A	7. C	8. A
9. B	10. B	11. B	12. D	13. D	14. A	15. 72	16. B
17. A	18. A	19. A	20. D	21. C	22. D	23. B	24. B
25. B	26. C	27. C	28. D	29. A	30. D	31. 7	32. C
33. 71	34. A	35. D	36. 3000	37. C	38. A	39. 2	40. C
41. 312	42. B	43. A	44. D	45. D	46. B	47. B	48. D
49. D	50. B	51. D	52. C	53. 4	54. C	55. A	56. D
57. D	58. C	59. A	60. D	61. B	62. C	63. C	64. B
65. 19	66. B	67. 2	68. D	69. A	70. 3	71. B	72. A
73. C	74. A	75. 27	76. A	77. A	78. C	79. D	80. B
81. C	82. C	83. C	84. B	85. C	86. A	87. D	88. D
89. A	90. A	91. A	92. 8788	93. B	94. D	95. A	96. 3734
97. B	98. C	99. 164	100. D	101. C	102. A	103. 6699	104. C
105. B	106. A	107. 13	108. B	109. 48	110. D	111. A	112. A
113. C	114. A	115. C	116. 36	117. 360	118. D	119. A	120. 1012
121. B	122. D	123. 22	124. B	125. A	126. A	127. C	128. C
129. C	130. 26664	131. 2	132. C	133. D	134. D	135. B	136. B
137. A	138. A	139. B	140. C	141. B	142. C	143. C	144. B
145. C	146. 6006	147. C	148. A	149. D	150. D	151. C	152. A
153. B	154. 4	155. D	156. 10	157. A	158. 5376	159. C	160. 5
161. D	162. 18	163. 22	164. D	165. 6	166. 61	167. 1494	168. B
169. 9	170. C	171. D	172. 6	173. C			

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