

JEE Main Session 2 Mathematics Exam: Model 3

- Find the eccentricity of an ellipse whose length of the minor axis is equal to half of the length between foci.
- The domain of $y = \cos^{-1} | ((2 - |x|) / 4) | + \log (3 - x)^{-1}$ is $[\alpha, \beta) - \{\gamma\}$, then find $\alpha + \beta + \gamma$.
- A line passes through (9,0), making angle 30° with positive direction of x-axis. It is rotated by angle of 15° with respect to (9,0). Find the equation of the new line.
- For a non-zero complex number z satisfying $z^2 + i\bar{z} = 0$, then value of $|z|^2$ is?
- If $|a| = 1$, $|b| = 4$, $a \cdot b = 2$ and $c = 2(a \times b) - 3b$, then what is the angle between b and c ?
- Set $S = \{0, 1, 2, 3, \dots, 10\}$
If a random ordered pair (x, y) of elements of S is chosen, then find probability that $|x - y| > 5$.
- Find the number of integral terms in the binomial expansion:
 $(7^{1/2} + 11^{1/6})^{824}$
- In a class, there are 40 students.
16 students passed in Chemistry.
20 students passed in Physics.
25 students passed in Maths.
15 students passed in both Math and Physics.
15 students passed in both Math and Chemistry
10 students passed in both Physics and Chemistry.
Find the maximum number of students that passed in all the subjects.
- Set $A = \{1, 2, 3, 4, 5, 6, 7\}$
If the number of functions from Set A to Power Set A can be expressed as m^n (where m is the least integer), then find $m + n$.
- $[1 / (1 - 3(1)^2 + 1^4)] + [2 / (2 - 3(2)^2 + 2^4)] + [3 / (3 - 3(3)^2 + 3^4)] + \dots$ (up to $n = 10$) = ?
- If one of the diameters of the circle $x^2 + y^2 - 10x + 4y + 13 = 0$ is a chord of another circle and whose centre is the point of intersection of the lines $2x + 3y = 12$ and $3x - 2y = 5$. then the radius of the circle is?
- An urn contains 15 red, 10 white, 60 orange, and 15 green balls. If 2 balls are taken with replacement, find the probability 1 ball is red and the other ball is white.
- $\lim_{x \rightarrow 0} [(e^{2\sin x} - 2|\sin x| - 1) / x^2] = ?$
- If three vectors are:
 $a = 3i + j - 2k$
 $b = 4i + j + 7k$
 $c = i - 3j + 4k$
If p is a vector such that $p \times b = c \times b$ and $p \cdot a = 0$, then find $p \cdot (i - j - k)$.
- Find the value of $20M$, if M is the median of the following data:

x_i	f_i	C.F.
0 - 4	2	2
4 - 8	4	6
8 - 12	7	13
12 - 16	8	21
16 - 20	6	27