

JEE Main 2024 Mathematics Question Paper

April 8 Shift 2

(B.E./B.Tech)

JEE Main Mathematics Questions

Ques 1. Number of 5 letters words made from the word "MATHEMATICS" is equal to

- A. 13540**
- B. 13560**
- C. 14210**
- D. 17310**

Ans, B

2
5 8
11 14 17

Ques 2. ,Then the sum of elements of 10th row.

- A. 1505**
- B. 1438**
- C. 1981**
- D. 1745**

Ans. A

Ques 3. Two points (5, 2) and (2, a). Line passes through these points makes an angle of $\pi/4$ at origin. The product of all values of a is equal to

- A. 8**

- B. -4
- C. -2
- D. 1

Ans. B

Ques 4. A circle $x^2 + y^2 = 8$ and a parabola $y^2 = 2x$ are given. Find area bounded by these two curves in first quadrant which lie inside the circle and outside the parabola.

- A. $\pi - \frac{2}{3}$
- B. $\pi - \frac{1}{3}$
- C. $\pi + \frac{1}{3}$
- D. $\pi - \frac{4}{3}$

Ans. A

Ques 5. Bag X contains five one-rupee coins, four five rupee coins. Bag Y contains 4 one rupee and 5 five rupees. Bag Z contains 3 one-rupee coins and 6 five rupee coins. If 1 rupee coin is selected at random, what is the probability it is drawn from bag Y?

- A. $\frac{1}{3}$
- B. $\frac{1}{4}$
- C. $\frac{1}{5}$
- D. $\frac{1}{6}$

Ans. A

Ques 6. A triangle is drawn inside a bounded region of $y^2 = 2x$ and $x = 24$. Then maximum area of triangle is

- A. $64\sqrt{3}$
- B. $108\sqrt{3}$
- C. $96\sqrt{3}$
- D. $120\sqrt{3}$

Ans. C

Ques 7. A ray of light coming from (3, 1) incident on $2x + y = 6$ and deflected ray passing through (7, 2). If equation of incident ray is $ax + by + 1 = 0$, then $a^2 + b^2 + 3ab =$

- A. $11/25$
- B. $-11/25$
- C. $-3/5$
- D. $3/5$

Ans. B

Ques 8. If $|x + 1||x + 3| - 4|x + 2| + 5 = 0$, then sum of squares of solutions is

Ans. 16

Ques 9. If solution of differential equation $xdy - ydx = xy(xdy - ydx)$ and $y(1) = 1$ is $\alpha|y| = |x|e^{(\alpha y - \beta)}$ then $(\alpha + \beta)$ is equal to

Ans. 2

Ques 10. If the complex number $(1 + 2i \cos \theta) / (1 - 3i \cos \theta)$ is purely imaginary, then find the number of values of θ in the interval $[-2\pi, 2\pi]$.

Ans. 8

Ques 11.

$$\text{Given } f(x) = \begin{cases} \frac{\tan((a+1)x) + \tan x \cdot b}{x} & x < 0 \\ 3 & x = 0 \\ \frac{\sqrt{ax + b^2 x^2} - \sqrt{ax}}{\sqrt{a} bx \sqrt{x}} & x > 0 \end{cases}$$

It is a continuous function at $x = 0$, then find b/a .

Ans. 6