

**JEE-Main-06-04-2024 (Memory Based)**  
**[MORNING SHIFT]**

**Maths**

**Question:** No. of triangles that can be formed from a regular octagon, provided no. side of octagon should be a side of triangle.

**Options:**

- (a) 8
- (b) 12
- (c) 14
- (d) 16

**Answer: (d)**

**Question:** Let the area of the region enclosed by curves  $y = 3x$ ,  $2y = 27 - 3x$  and  $y = 3x - 2\sqrt{x}$  be A Then.  $10A$  is equal to 162 184, 154, 172

**Options:**

- (a) 122
- (b) 132
- (c) 152
- (d) 162

**Answer: (d)**

**Question:** Find interval in which  $x^x$  is strictly increasing

**Options:**

- (a)  $(0, \infty)$
- (b)  $\left(0, \frac{1}{e}\right]$
- (c)  $\left[\frac{1}{e^2}, \infty\right)$
- (d)  $\left(\frac{1}{e}, \infty\right)$

**Answer: (d)**

**Question:** Two factories A and B. 60% cars were made in A factory and remaining were made in B factory. Then we have 80% cars from Factory A is the standard Quality 90% of cars from factory B is a standard quality. A car is picked randomly and found it as standard, the probability that car came from B is P. Find  $126P$ ?

**Options:**

- (a) 54
- (b) 52

- (c) 48  
(d) 27

**Answer: (a)**

**Question:** Let a circle touch the parabola  $y = 6 - x^2$  and touch the lines  $y = \sqrt{3}|x|$  such that the circle has minimum area. Then which of the following points lie on the circle

**Options:**

- (a) (2, 2)  
(b) (1, 1)  
(c) (1, 2)  
(d) (2, 4)

**Answer: (d)**

$$A_r = \begin{vmatrix} r & 1 & \frac{\pi^2}{2} + \alpha \\ 2r & 2 & n^2 - \beta \\ 3r - 1 & 3 & \frac{n}{2}(3n - 1) \end{vmatrix}$$

**Question:** If then the value of  $2A_{10} - A_8$  is equal to

**Options:**

- (a)  $4\alpha + 2\beta$   
(b)  $2n$   
(c) 0  
(d)  $2\alpha + 4\beta$

**Answer: (a)**

$$f(x) = \begin{cases} x^3 \sin\left(\frac{1}{x}\right), & x \neq 0, \\ 0, & x = 0 \end{cases} \text{ then}$$

**Question:** If

**Options:**

- (a)  $f''\left(\frac{2}{\pi}\right) = \frac{12 - \pi^2}{2\pi}$   
(b)  $f'(0) = 0$   
(c)  $f'(0) = 1$

(d)  $f''\left(\frac{2}{\pi}\right) = \frac{24 - \pi^2}{2\pi}$

**Answer: (a)**

**Question:** R is defined on set  $X = \{1, 2, \dots, 20\}$  and  $R_1 = \{(x, y) : 2x - 3y = 2\}$ ,  $R_2 = \{(x, y) : 5x - 4y = 0\}$ . If M, N represent the number of elements to be added to make  $R_1$  &  $R_2$  symmetric respectively. Then find the value of  $M + N$ .

**Options:**

- (a) 10  
(b) 8  
(c) 12  
(d) 11

**Answer: (a)**

**Question:** If mean and standard deviation of 20 observations are 10 and 2. It was better found that one of the value was 8 instead of 12. Find the correct standard deviation.

**Options:**

- (a) 1.8

- (b)  $\sqrt{3.96}$
- (c)  $\sqrt{3.84}$
- (d) 1.93

**Answer: (b)**

**Question:** The value of  $\int_0^{\frac{\pi}{4}} \frac{\cos^2 x \sin^2 x}{(\cos^3 x + \sin^3 x)^2} dx$  is equal to

**Options:**

- (a)  $\frac{1}{6}$
- (b)  $\frac{1}{3}$
- (c)  $\frac{1}{2}$
- (d) 1

**Answer: (a)**

**Question:** 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  $y(e-1) = 0$  the  $y(e)$  is equal to

**Options:**

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

**Answer: (a)**

**Question:** If the function  $f(x) = \frac{x^2 + 2x - 15}{x^2 - 4x + 9}; x \in R$  is .....

**Options:**

- (a) Neither one-one - nor= onto
- (b) One-one but not onto
- (c) Onto but not one-one
- (d) Both one-one and onto

**Answer: (a)**

**Question:**

$$x^2 - (t^2 - 5t + 6)x + 1 = 0$$

$$A_n = \alpha^n + \beta^n$$

Find min value  $\frac{A_{2025} + A_{2023}}{A_{2024}}$

**Answer: (-1/4)**

**Question:** If 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> term of  $(x + y)^n$  are respectively 135, 30, 10/3. Find  $6 \cdot [n^3 + x^2 + y]$

**Answer: 806**