JEE-Main-01-02-2024 (Memory Based)
[EVENING SHIFT]

Mathematics

Question: Let α and β the roots of equation $px^2+qx-r=0$, where $P\neq 0$. If p,q,r be the consecutive term of non constant G.P. and $\frac{1}{\alpha}+\frac{1}{\beta}=\frac{3}{4}$, then the value of $(\alpha-\beta)^2$ is:

Answer: $\frac{80}{9}$

Solution:

Question: If the mirror image of the point P(3, 4, 9) in the line $\frac{x-1}{3}=\frac{y+1}{2}=\frac{z-2}{1}$ is (α,β,γ) then find $(\alpha+\beta+\gamma)$ is

Answer: 108.00

Solution:

Question: The number of solutions of the equation $4\sin^2 x-4\cos^3 x+9-4\cos x=0,\ x\in[-2\pi,2\pi]$ is:

Answer: 0.00

Solution:

Question: If the domain of the function $f(x)=\frac{\sqrt{x^2-25}}{\left(\sqrt{4-x^2}\right)}+\log\left(x^2+2x-15\right)$ is $(-\infty,\alpha)\cup[\beta,\infty)$ then $\alpha^2+\beta^2$ is equal to

Answer: 50.00

Solution:

Question: Let the system of equation $x+2y+3z=5,\ 2x+3y+z=9,\ 4x+3y+\lambda z=\mu$ have infinite number of solution. Then $\lambda+2\mu$ is equal to

Answer: 17.00

Solution:

Question: The value of $\int_0^1\left(2x^3-3x^2-x+1\right)^{\frac{1}{3}}dx$

Options:

(a) -1
(b) 1
(c) 0
(d) 2
Answer: (c)
Solution:

Question: The probability that Ajay will not go to office is $\frac{1}{5}$ and probability that Ajay and Vijay will not go to the office is $\frac{2}{7}$, if their visits of office is independent of each other, then find the probability that Ajay will go to the office, but Vijay will not go, is
Options:
(a) $\frac{12}{28}$
(b) $\frac{13}{35}$
(c) $\frac{18}{35}$
(d) $\frac{24}{35}$
Answer: (c)
Solution:

Question: $\int_0^{\frac{\pi}{3}} \cos^4 x\,dx$ is equal to $a\pi + b\sqrt{3}$, then $a^2 + b$ is equal to:
Options:
(a) $\frac{1}{2}$
(b) $\frac{1}{8}$
(c) $\frac{1}{4}$
(d) 1
Answer: (b)
Solution:

Question: Let m and n be the coefficient of 7^{th} and 13^{th} term in expansion of $\left(\frac{1}{3}x^{\frac{1}{3}} + \frac{1}{2x^{\frac{2}{5}}}\right)^{18}$ then $\left(\frac{m}{n}\right)^{\frac{1}{3}}$
Options:
(a) $\frac{1}{4}$

(b) $\frac{4}{7}$

(c) $\frac{1}{9}$

(d) $\frac{4}{9}$

Answer: (d)

Solution:

Question: The minimum value of $\left|z+\frac{3+4i}{2}\right|;|z|\leq 1$ is

Options:

(a) $\frac{3}{2}$

(b) $\frac{5}{2}$

(c) 3

(d) 5

Answer: (a)

Solution:

Question: Let vertex A(2, 3, 1), B(3, 2, -1), C(-2, 1, 3). If AD is angle bisector of angle A, then projection of $\overrightarrow{AD}$ on $\overrightarrow{AC}$ is equal to

Options:

(a) $\frac{\sqrt{3}}{2}$

(b) $\sqrt{\frac{2}{3}}$

(c) $\sqrt{\frac{3}{2}}$

(d) $\frac{2}{\sqrt{3}}$

Answer: (b)

Solution:

Question: If the system of equations:

$x+2y+3z=5$

$3x+3y+z=9$

$x+4y+\lambda z=\mu$

have infinitely many solutions then the value of $3\lambda+\mu$ equals to

Options:

(a) 17

(b) 21
(c) 43
(d) 34
Answer: (d)
Solution:

Question: $\frac{dx}{dy}=\frac{1+x-y^2}{y}$ and $x(1)=1,$ then $5x(2)$ is equal to _____.
Answer: 5.00
Solution:

Question: If $y=\frac{\left(\sqrt{x}+1\right)\left(x^2-\sqrt{x}\right)}{x\sqrt{x}+x+\sqrt{x}}+\frac{1}{15}\left(3\cos^5 x-5\cos^3 x\right)$ then $96y'\left(\frac{\pi}{6}\right)$ equals to ____.
Answer: 105.00
Solution:

Question: Let S_n be the sum of first n terms of an A.P. If $S_{10}=390$ and the ratio of the tenth and the fifth terms is 15:7, then $S_{15}-S_5$ is equal to
Answer: 790.00
Solution:

Question: There are 20 lines numbered as 1, 2, 3, …., 20. And the odd numbered lines intersect at a point and all the even numbered lines are parallel. Find the maximum number of point of intersections.
Answer: 101.00
Solution:

Question: Let the focus of the mid point of the chords of the circle $x^2+(y-1)^2=1$ drawn from the origin intersects the line $x+y=1$ at P and Q. Then the length of PQ is
Answer: $\frac{1}{\sqrt{2}}$
Solution: