Telangana State Council Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	EngineeringEnglish 18th Jul 2022 Shift 2
Subject Name :	Engineering (English)
Creation Date :	2022-07-19 13:06:33
Duration :	180
Total Marks :	160
Display Marks:	No
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Engineering (English)

Group Number :	1
Group Id :	1056152
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	160
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics

Section Id :	1056154
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	80
Number of Questions to be attempted :	80
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	1056154
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 105615161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Let $\mathbb{R}$ be the set of all real numbers.

Statement I : The function $f:\left(-\frac{\pi}{2},\frac{\pi}{2}\right)\to\mathbb{R}$ defined by $f(x)=\sec x+\tan x$ is a one - one function.

Statement II : The function $f:[0,\infty)\to\mathbb{R}$ defined by $f(x)=x^2$ is a one – one function.

Which of the above statements is(are) true?

Options :

Statement I is true, but Statement II is false

1. ✖

Statement II is true, but Statement I is false

2. ✖

Both Statement I and Statement II are true

3. ✔

Both Statement I and Statement II are false

4. ✖

Question Number : 2 Question Id : 105615162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Let $\mathbb{R}$ be the set of all real numbers. Let $f:\mathbb{R}\to\mathbb{R}$ be a function defined by

$$f(x)=\begin{cases}2x-5, & \text{if } x<-3\\ x+2, & \text{if } -3\le x<5\\ 3x+1, & \text{if } x\ge 5\end{cases}$$

Match the following

	List – I		List – II
A)	$f(-5)+f(0)+f(-1)=$	I)	16
B)	$f(f(5)+10f(-3))=$	II)	40
C)	$f(\lvert f(-4)\rvert)=$	III)	−32
D)	$f(f(f(1)))=$	IV)	−12
		V)	19

The correct match is

Options :

1. ✖

A	B	C	D
III	II	V	I

2. ✖

A	B	C	D
V	IV	I	III

3. ✔

A	B	C	D
IV	V	II	I

4. ✖

A	B	C	D
IV	V	III	I

Question Number : 3 Question Id : 105615163 Question Type : MCQ Option Shuffling : Yes Display Question Number :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

$$\text{If } A+B=\begin{bmatrix}2&1&2\\1&2&0\\0&2&2\end{bmatrix}, AB=\begin{bmatrix}1&2&2\\1&1&0\\1&2&1\end{bmatrix} \text{ then } A^2+B(A+B)=$$

Options :

1. ✔ $\begin{bmatrix}4&6&6\\3&4&2\\1&6&3\end{bmatrix}$

2. ✖ $\begin{bmatrix}4&9&6\\3&3&2\\4&7&4\end{bmatrix}$

3. ✖ $\begin{bmatrix}6&10&8\\4&5&2\\4&9&6\end{bmatrix}$

4. ✖ $\begin{bmatrix}3&4&4\\2&3&2\\0&4&2\end{bmatrix}$

Question Number : 4 Question Id : 105615164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

A, P, B are 3×3 matrices. If $|-B|=5$, $|BA^T|=15$, $|P^TAP|=-27$, then one of the values of $|P|$ is

Options :

3

1. ✔

-5

2. ✖

9

3. ✖

6

4. ✖

Question Number : 5 Question Id : 105615165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If A is a 3×3 matrix and $|A|=\frac{1}{2}$ then $\left|A^{-1}\left(\text{Adj}(\text{Adj}A)\right)\right|^{-1}=$

Options :

8

1. ✔

$\frac{1}{8}$

2. ✖

$\frac{1}{2}$

3. ✖

2

4. ✖

Question Number : 6 Question Id : 105615166 Question Type : MCQ Option Shuffling : Yes Display Question Number :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Let $x=\alpha,\ y=\beta,\ z=\gamma$ be the unique solution of the system of simultaneous linear equations $2x+3y-2z+4=0,\ 3x-4y+3z+5=0,\ kx-2y+z+3=0$. If $\alpha=-2$ then $k=$

Options :

$\begin{vmatrix}1 & 2\\ 3 & 5\end{vmatrix}$

1. ✖

$\begin{vmatrix}5 & 3\\ 1 & 2\end{vmatrix}$

2. ✖

$\begin{vmatrix}3 & 5\\ 1 & 2\end{vmatrix}$

3. ✔

$\begin{vmatrix}3 & 5\\ 2 & 1\end{vmatrix}$

4. ✖

Question Number : 7 Question Id : 105615167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

If the point (x, y) satisfies the equation $\frac{x+i(x-2)}{3+i}-i=\frac{2y+i(1-3y)}{i-3}$, then $x+y=$

Options :

4

1. ✖

2

2. ✔

0

3. ✖

-2

4. ✖

Question Number : 8 Question Id : 105615168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\cos\alpha+\cos\beta+\cos\gamma=0$ and $\sin\alpha+\sin\beta+\sin\gamma=0$ then $\cos 2\alpha+\cos 2\beta+\cos 2\gamma=$

Options :

$\frac{3}{2}$

1. ✖

$\cos^2\frac{\alpha}{2}+\cos^2\frac{\beta}{2}+\cos^2\frac{\gamma}{2}$

2. ✖

$3\sin(\alpha+\beta+\gamma)$

3. ✖

$\cos(\alpha+\beta)+\cos(\beta+\gamma)+\cos(\gamma+\alpha)$

4. ✔

Question Number : 9 Question Id : 105615169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

One of the values of $(-32i)^{\frac{2}{5}}$ is

Options :

$4\,cis\frac{2\pi}{5}$

1. ✖

$4\,cis\frac{3\pi}{5}$

2. ✔

$4\,cis\frac{4\pi}{5}$

3. ✖

$4\,cis\frac{6\pi}{5}$

4. ✖

Question Number : 10 Question Id : 105615170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the quadratic equations $x^2-7x+3c=0$ and $x^2+x-5c=0$ have a common root, then for non-zero real value of c the sign of the expression x^2-3x+c is

Options :

negative for all $x\in\mathbb{R}$

1. ✖

positive for all $x\in(1,3)$

2. ✖

negative for all $x \in (1,3)$

3. ✖

positive for all $x \in \mathbb{R}$

4. ✔

Question Number : 11 Question Id : 105615171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $f(x)=\frac{6x^2-18x+21}{6x^2-18x+17}$. If m is the maximum value of $f(x)$ and $f(x)>n \ \forall x \in \mathbb{R}$ Then $14m-7n=$

Options :

-1

1. ✖

23

2. ✔

35

3. ✖

42

4. ✖

Question Number : 12 Question Id : 105615172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If α, β, γ are the roots of the equation $x^3+x^2+x+r=0$ and $\alpha^3+\beta^3+\gamma^3=5$, then $r=$

Options :

1. ✖ $\frac{-1}{2}$

2. ✖ 1

3. ✔ -1

4. ✖ $\frac{1}{2}$

Question Number : 13 Question Id : 105615173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\frac{5}{2}$ is the sum of two roots of the equation $6x^6 - 25x^5 + 31x^4 - 31x^2 + 25x - 6 = 0$ then the sum of all non-real roots of the equation is

Options :

1. ✖ does not exist

2. ✖ 0

3. ✔ $\frac{5}{3}$

$\frac{2}{5}$

4. ✖

Question Number : 14 Question Id : 105615174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $1+\sqrt{2}$ and $2-i$ are the roots of the equation $x^4+bx^3+cx^2+dx+e=0$ where b, c, d, e are rational numbers, then the roots of the equation $bx^2+cx+d=0$ are

Options :

real and different

1. ✖

real and equal

2. ✔

purely imaginary

3. ✖

complex conjugate

4. ✖

Question Number : 15 Question Id : 105615175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let the transformed equation of $2x^4-8x^3+3x^2-1=0$ so that the term containing the cubic power of x is absent be $2x^4+bx^2+cx+d=0$. Then $b=$

Options :

-18

1. ✖

−15

2. ✖

−9

3. ✔

−16

4. ✖

Question Number : 16 Question Id : 105615176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

a, b, c are three particular speakers among the 10 speakers of a meeting. The number of ways of arranging all the 10 speakers on the dias in a row so that all the three speakers a, b, c do not sit together is

Options :

714 (7!)

1. ✖

89 (8!)

2. ✖

719 (7!)

3. ✖

84 (8!)

4. ✔

Question Number : 17 Question Id : 105615177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The exponent of 6 in 72! is

Options :

34

1. ✔

70

2. ✖

17

3. ✖

35

4. ✖

Question Number : 18 Question Id : 105615178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the 4^{th} term in the expansion of $\left(\frac{x}{2}-\frac{2y}{3}\right)^6$ is -20, then $xy =$

Options :

2

1. ✖

3

2. ✔

8

3. ✖

27

4. ✖

Question Number : 19 Question Id : 105615179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\int \frac{x+3}{(x-1)^2(2x-1)}dx = \frac{A}{x-1} + B\log(2x-1) + C\log(x-1) + K$ then $A + B + C =$

Options :

3

1. ✖

11

2. ✖

-4

3. ✔

-11

4. ✖

Question Number : 20 Question Id : 105615180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\frac{x^2+7}{(x^2+1)(x-2)} = \frac{A}{x-2} + \frac{Bx+C}{x^2+1}$, then the determinant of the matrix $\begin{pmatrix} A & B \\ C & \frac{2}{5} \end{pmatrix}$ is

Options :

5

1. ✖

-5

2. ✖

$\frac{94}{25}$

3. ✖

-2

4. ✔

Question Number : 21 Question Id : 105615181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\tan 15°$ and $\tan 30°$ are the roots of the equation $x^2 + px + q = 0$, then $pq =$

Options :

$\frac{6\sqrt{3}+10}{\sqrt{3}}$

1. ✖

$\frac{10-6\sqrt{3}}{3}$

2. ✔

$\frac{10+6\sqrt{3}}{3}$

3. ✖

$\frac{10-6\sqrt{3}}{\sqrt{3}}$

4. ✖

Question Number : 22 Question Id : 105615182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\cos x+\cos y=p, \sin x+\sin y=q$, then $\cos\left(\frac{x-y}{2}\right)=$

Options :

1. $\pm\frac{\sqrt{p^2+q^2}}{2}$ ✔

2. $\pm\frac{pq}{2}$ ✖

3. $\pm\left(\frac{p+q}{2}\right)$ ✖

4. $\pm\frac{\sqrt{p^2+q^2}}{4}$ ✖

Question Number : 23 Question Id : 105615183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $A+B+C=\frac{3\pi}{2}$ then $4\sin A\sin B\sin C+\cos 2A+\cos 2B+\cos 2C=$

Options :

1. $-\sin(A+B+C)$ ✔

2. $\cos(A+B+C)$ ✖

$\sin(A+B+C)$

3. ✖

$2-\cos(A+B+C)$

4. ✖

Question Number : 24 Question Id : 105615184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\frac{e^{4x}+e^{-4x}+14}{4\left(e^{x}-e^{-x}\right)^{2}}=$$

Options :

$\sin h^2 x+\cot h^2 x$

1. ✔

$\sin h^2 x+\sec h^2 x$

2. ✖

$\cos h^2 x+\sec h^2 x$

3. ✖

$\cos h^2 x+\tan h^2 x$

4. ✖

Question Number : 25 Question Id : 105615185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\text{If } \tan h\, x=\frac{1}{2} \text{ then } \sin h\, 2x-\sec h\, 2x=$$

Options :

$\frac{29}{15}$

1. ✖

$\frac{11}{15}$

2. ✔

3

3. ✖

$\frac{-13}{15}$

4. ✖

Question Number : 26 Question Id : 105615186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In triangle ABC, if A is acute, C is obtuse, $\sin A = \frac{3\sqrt{3}}{14}$, $a = 3$ and $b = 5$, then $c =$

Options :

$\frac{16}{7}$

1. ✖

7

2. ✔

$\frac{14}{3}$

3. ✖

6

4. ✖

Question Number : 27 Question Id : 105615187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If Δ denotes the area of triangle ABC, then $(b\sin C + c\sin B)(b\cos C + c\cos B) =$

Options :

1. $ab\cos C$ ✖

2. 2Δ ✖

3. $bc\cos A$ ✖

4. 4Δ ✔

Question Number : 28 Question Id : 105615188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let A be the area of in-circle and A_1, A_2, A_3 be the areas of ex-circles of a triangle. If $A_1 = 4, A_2 = 9, A_3 = 16$, then $A =$

Options :

1. 81 ✖

2. $\frac{61}{169}$ ✖

3. $\frac{144}{61}$ ✖

$\frac{144}{169}$

4. ✔

Question Number : 29 Question Id : 105615189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $3\bar{i}-5\bar{j}+2\bar{k}$, $7\bar{i}+2\bar{j}-4\bar{k}$, $\bar{i}-3\bar{j}+4\bar{k}$ and $-7\bar{i}-17\bar{j}+16\bar{k}$ are position vectors of the points A, B, C and D respectively, then the angle between $\overline{AB}$ and $\overline{CD}$ is

Options :

0°

1. ✖

$\frac{\pi}{4}$

2. ✖

$\frac{\pi}{2}$

3. ✖

π

4. ✔

Question Number : 30 Question Id : 105615190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $A(2\bar{i}+\bar{j}-\bar{k})$, $B(\lambda\bar{i}+5\bar{j}+4\bar{k})$, $C(-4\bar{i}+3\bar{j}+2\bar{k})$ and $D(-\bar{i}-2\bar{j}+3\bar{k})$ are four points in space such that $\overline{AB}=x\overline{AC}+y\overline{AD}$ for some real numbers $x\neq 0, y\neq 0$ then $17(\lambda+9)=$

Options :

5

1. ✖

3

2. ✖

7

3. ✔

9

4. ✖

Question Number : 31 Question Id : 105615191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let a plane P has the points $\bar{i}$, $\bar{j}$ and $\bar{i}+\bar{j}+\bar{k}$. Let L be the line through the point A and parallel to the vector $\bar{i}-\bar{j}+\bar{k}$. If the plane P and line L intersect at a point $B(0,3,2)$ and the distance from A to B is 3 units, then equations of the normal to the plane P through A are

Options :

1. ✔ $\frac{x-3}{1}=\frac{y}{1}=\frac{z-5}{-1}$

2. ✖ $\frac{x+3}{1}=\frac{y-6}{1}=\frac{z-1}{-1}$

3. ✖ $\frac{x+3}{1}=\frac{y}{1}=\frac{z-5}{-1}$

4. ✖ $\frac{x+3}{1}=\frac{y-6}{-1}=\frac{z+1}{1}$

Question Number : 32 Question Id : 105615192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $\bar{a}=\bar{i}+\bar{j}+\bar{k}$ and $\bar{b}$ be two vectors such that $\bar{a}\cdot\bar{b}=1$, $\cos\left(\bar{a},\bar{b}\right)=\frac{1}{3}$ and the components of $\bar{b}$ w.r.t $\left(\bar{i},\bar{j},\bar{k}\right)$ be integers. Then the number of possible vectors that represent $\bar{b}$ is

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 4

Question Number : 33 Question Id : 105615193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let π_1 be the plane passing through the point $2\bar{i}-\bar{j}+\bar{k}$ and perpendicular to the vector $a\bar{i}+2\bar{j}-3\bar{k}$ and π_2 be the plane passing through the point $\bar{i}+2\bar{j}-\bar{k}$ and perpendicular to the vector $\bar{i}-2\bar{j}+\bar{k}$. If θ is the angle between the planes π_1 and π_2 and $\cos\theta=-\sqrt{\frac{3}{7}}$, then the integral value of a is

Options :

1. ✖ −2

-1

2. ✖

2

3. ✖

1

4. ✔

Question Number : 34 Question Id : 105615194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\bar{a}$ and $\bar{b}$ are two vectors such that $\bar{a}=2\bar{i}+2\bar{j}+p\bar{k}$, $|\bar{b}|=7$, $\bar{a}\cdot\bar{b}=4$ and $|\bar{a}\times\bar{b}|=5\sqrt{17}$ then $p=$

Options :

± 5

1. ✖

± 6

2. ✖

± 1

3. ✔

± 3

4. ✖

Question Number : 35 Question Id : 105615195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The mean deviation from the mean of the discrete data 1, 3, 4, 7, 11, 18, 29, 47, 78 is

Options :

22

1. ✖

24

2. ✖

$\frac{176}{9}$

3. ✔

$\frac{182}{9}$

4. ✖

Question Number : 36 Question Id : 105615196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

When two dice are thrown, the probability of getting a prime number on one die and a composite number on the other is

Options :

$\frac{1}{3}$

1. ✔

$\frac{1}{4}$

2. ✖

$\frac{1}{2}$

3. ✖

$\frac{1}{6}$

4. ✖

Question Number : 37 Question Id : 105615197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let A, B, C be three pairwise independent events of a random experiment. If $P(\overline{B} \cup \overline{C}) = \frac{1}{2}, P(A) > 0, P(B) = b$ and $P(C) = c$, then $P((\overline{B} \cap \overline{C}) \mid A) =$

Options :

$1 + b - c$

1. ✖

$2 + b - c$

2. ✖

$\frac{3}{2} - b - c$

3. ✔

$2 - b - c$

4. ✖

Question Number : 38 Question Id : 105615198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Two dice are thrown and the sum of the numbers appearing on the dice is observed to be a multiple of 4. If p is the conditional probability that number 4 has appeared atleast once, then 3p + 2 =

Options :

$\frac{25}{12}$

1. ✖

2. ✖ $\frac{1}{6}$

3. ✔ $\frac{7}{3}$

4. ✖ $\frac{5}{2}$

Question Number : 39 Question Id : 105615199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In a random experiment of throwing 5 coins, the number of heads is defined as a random variable. The mean of the random variable is

Options :

1. ✖ $\frac{2}{3}$

2. ✖ $\frac{3}{2}$

3. ✖ $\frac{7}{9}$

4. ✔ $\frac{5}{2}$

Question Number : 40 Question Id : 105615200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The variance of a Poisson variate X is 2. Then $P(X \geq 3) =$

Options :

1. ✖ $\frac{e^2 - 7}{e^2}$

2. ✖ $\frac{e^2 - 3}{e^2}$

3. ✔ $\frac{e^2 - 5}{e^2}$

4. ✖ $1 - \frac{4}{e^2}$

Question Number : 41 Question Id : 105615201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the perimeter of a triangle is 20 and two of its vertices are (–5, 0) and (6, 0), then the locus of the third vertex is

Options :

1. ✔ $40x^2 - 81y^2 - 40x - 800 = 0$

2. ✖ $40x^2 + 9y^2 - 25x + 800 = 0$

$40x^2 - 9y^2 = 800$

3. ✖

$5x^2 - 3y^2 + 3x - 4y + 25 = 0$

4. ✖

Question Number : 42 Question Id : 105615202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The transformed equation of $3x^2 + 4xy + y^2 - 8x - 4y - 4 = 0$ is $f(X,Y) = aX^2 + 2hXY + bY^2 + c = 0$ when the origin is shifted to a new point by the translation of axes. Then $f(1,1) =$

Options :

0

1. ✔

1

2. ✖

-1

3. ✖

-8

4. ✖

Question Number : 43 Question Id : 105615203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the line $2x - 3y + 4 = 0$ divides the line segment joining the points $A(-2, 3)$ and $B(3, -2)$ in the ratio $m:n$, then the point which divides AB in the ratio $-4m:3n$ is

Options :

$(-17,18)$

1. ✔

$\left(-\frac{59}{7},\frac{66}{7}\right)$

2. ✖

$(-5,6)$

3. ✖

$\left(-\frac{5}{7},\frac{12}{7}\right)$

4. ✖

Question Number : 44 Question Id : 105615204 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the lines $L_1 \equiv 2x+y+3=0$, $L_2 \equiv kx+2y-3=0$ and $L_3 \equiv 3x-2y+1=0$ are concurrent then the cosine of the acute angle between the lines $L_2 = 0$ and $2x-5y+7=0$ is

Options :

$\frac{1}{\sqrt{2}}$

1. ✖

$\left(\frac{15}{2\sqrt{29}}\right)$

2. ✖

$\left(\frac{25}{29}\right)$

3. ✖

$\left(\frac{20}{29}\right)$

4. ✔

Question Number : 45 Question Id : 105615205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If Q is the image of the point P(1,1) with respect to the straight line $x+y+1=0$, then the length of the perpendicular drawn from Q to the line $3x-4y+3=0$ is

Options :

$\frac{5}{2}$

1. ✖

2

2. ✖

1

3. ✔

$\frac{1}{2}$

4. ✖

Question Number : 46 Question Id : 105615206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The centroid of the triangle formed by the lines $x-3y+3=0$, $x+3y+3=0$, $x+y-1=0$ is

Options :

$\left(0,\frac{-1}{3}\right)$

1. ✔

$\left(\frac{2}{3},-1\right)$

2. ✖

$\left(\frac{-1}{3},1\right)$

3. ✖

$\left(1,\frac{-1}{3}\right)$

4. ✖

Question Number : 47 Question Id : 105615207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the slope of one of the lines represented by $5x^2+\frac{40}{3}xy+ky^2=0$ is 3, then the angle between the pair of lines is

Options :

0°

1. ✖

$\frac{\pi}{4}$

2. ✖

$\frac{\pi}{3}$

3. ✖

$\frac{\pi}{2}$

4. ✔

Question Number : 48 Question Id : 105615208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If a line L is common to the pairs of lines $6x^2 - xy - 12y^2 = 0$ and $15x^2 + 14xy - 8y^2 = 0$, then the combined equation the other two lines is

Options :

$10x^2 - 19xy + 6y^2 = 0$

1. ✔

$5x^2 - 4xy + 7y^2 = 0$

2. ✖

$x^2 - 9xy + y^2 = 0$

3. ✖

$3x^2 + 6xy + 11y^2 = 0$

4. ✖

Question Number : 49 Question Id : 105615209 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

If L is a line passing through the point $(-1,1)$ and parallel to the common line of the pairs of lines $6x^2 - xy - 12y^2 = 0$ and $15x^2 + 14xy - 8y^2 = 0$, then the equation of pair of lines joining the origin to the points of intersection of the curve $2x^2 - xy - y^2 + x - y = 0$ and the line L is

Options :

$x^2 - xy - y^2 = 0$

1. ✖

$x^2 + xy - y^2 = 0$

2. ✖

$x^2 - y^2 = 0$

3. ✔

$2x^2 + 3xy - 6y^2 = 0$

4. ✖

Question Number : 50 Question Id : 105615210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

From a point A(0, 3) on the circle $(x+2)^2 + (y-3)^2 = 4$, a chord AB is drawn and it is extended to a point Q such that AQ = 2AB. Then the locus of Q is

Options :

$(x+4)^2 + (y-3)^2 = 16$

1. ✔

$(x+1)^2 + (y-3)^2 = 32$

2. ✖

$(x+1)^2 + (y-3)^2 = 4$

3. ✖

$(x+1)^2 + (y-3)^2 = 1$

4. ✖

Question Number : 51 Question Id : 105615211 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If m_1, m_2 are the slopes of the tangents drawn from a point $(1,-3)$ to the circle $x^2 + y^2 - 6x + 4y + 12 = 0$ then $9\left(m_1^2 + m_2^2\right) =$

Options :

16

1. ✔

25

2. ✖

4

3. ✖

1

4. ✖

Question Number : 52 Question Id : 105615212 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If A, B are the points of contact of the tangents drawn from the point $P(-2,-3)$ to the circle $x^2+y^2-8x-10y+5=0$ and the chord AB subtends an angle θ at P then $\tan\theta=$

Options :

$\frac{3}{4}$

1. ✖

$\frac{24}{7}$

2. ✔

$\frac{7}{24}$

3. ✖

$\frac{4}{3}$

4. ✖

Question Number : 53 Question Id : 105615213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The equation of the transverse common tangent of the circles $x^2+y^2-6x-8y+9=0$ and $x^2+y^2+2x-2y+1=0$ is

Options :

1. $4x+3y-4=0$ ✔

2. $3x+y-1=0$ ✖

3. $2x-y+2=0$ ✖

4. $x+2y-3=0$ ✖

Question Number : 54 Question Id : 105615214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If θ is the angle between the circles $x^2+y^2-2x-4y-4=0$ and $x^2+y^2-8x-12y+43=0$ then $|7\sec\theta-18\cos\theta|=$

Options :

1. 11 ✔

2. 9 ✖

0

3. ✖

1

4. ✖

Question Number : 55 Question Id : 105615215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\left(0, \frac{3}{4}\right)$ is the radical centre of the circles $S \equiv x^2 + y^2 + \alpha x + 6y = 0$, $S' \equiv x^2 + y^2 + 2\alpha x + \alpha y + 6 = 0$ and $S'' \equiv x^2 + y^2 + 6\alpha x - \alpha y + 3 = 0$ then the distance between the radical centre and the centre of the circle $S' = 0$ is

Options :

8

1. ✖

15

2. ✖

$\frac{\sqrt{65}}{4}$

3. ✔

$\frac{\sqrt{5}}{4}$

4. ✖

Question Number : 56 Question Id : 105615216 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The vertex and the focus of the parabola $2x^2 + 5y - 6x + 1 = 0$ respectively, are

Options :

$\left(\frac{-3}{2},\frac{7}{10}\right),\left(\frac{-3}{2},\frac{53}{40}\right)$

1. ✖

$\left(\frac{-3}{2},\frac{7}{10}\right),\left(\frac{-3}{2},\frac{3}{40}\right)$

2. ✖

$\left(\frac{3}{2},\frac{7}{10}\right),\left(\frac{3}{2},\frac{53}{40}\right)$

3. ✖

$\left(\frac{3}{2},\frac{7}{10}\right),\left(\frac{3}{2},\frac{3}{40}\right)$

4. ✔

Question Number : 57 Question Id : 105615217 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The axis of a parabola is along the line $y = x$ and the distance of its vertex A from (0, 0) is $\sqrt{2}$ and that of its focus S from (0, 0) is $2\sqrt{2}$. If A and S lie in first quadrant, then the equation of the parabola in parametric form is

Options :

$x=(t+1)^2, y=(t-1)^2$

1. ✔

$x=t^2, y=2t$

2. ✖

$x=\left(t-\sqrt{2}\right)^2, y=\left(t+\sqrt{2}\right)^2$

3. ✖

$x = t^2 + 5, y = t^2 - 5$

4. ✖

Question Number : 58 Question Id : 105615218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $S \equiv \frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0,\ S' \equiv \frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} - 1 = 0$ be two intersecting ellipses. If $p(a\cos\theta, b\sin\theta)$ and $Q\left(a\cos\left(\frac{\pi}{2}+\theta\right), b\sin\left(\frac{\pi}{2}+\theta\right)\right)$ are their points of intersection then $\frac{1}{2}\left(a^2\beta^2 + b^2\alpha^2\right) =$

Options :

$a^2 b^2$

1. ✖

$\alpha^2 + \beta^2$

2. ✖

$a^2 + b^2$

3. ✖

$\alpha^2 \beta^2$

4. ✔

Question Number : 59 Question Id : 105615219 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$P(\theta_1)$ and $Q(\theta_2)$ are two points on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with eccentricity e. If PSQ is a focal chord and $\tan\left(\frac{\theta_1}{2}\right)\tan\left(\frac{\theta_2}{2}\right)=-(2\sqrt{2}+3)$, then e and S are

Options :

1. $\frac{1}{\sqrt{3}}, \left(\frac{a}{\sqrt{3}},0\right)$ ✖

2. $\frac{1}{\sqrt{3}}, \left(\frac{-a}{\sqrt{3}},0\right)$ ✖

3. $\frac{1}{\sqrt{2}}, \left(\frac{a}{\sqrt{2}},0\right)$ ✖

4. $\frac{1}{\sqrt{2}}, \left(\frac{-a}{\sqrt{2}},0\right)$ ✔

Question Number : 60 Question Id : 105615220 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let S be the focus of the hyperbola $\frac{x^2}{16}-\frac{y^2}{9}=1$ lying on the positive X− axis and $P(5,y_1)$ be point on the hyperbola. Then SP =

Options :

1. $\frac{1}{4}$ ✖

$\frac{3}{4}$

2. ✖

$\frac{9}{4}$

3. ✔

$\frac{5}{4}$

4. ✖

Question Number : 61 Question Id : 105615221 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $P(\theta)=\left(x_1,\frac{3\sqrt{5}}{2}\right)$, $0<\theta<\frac{\pi}{2}$ is a point on the hyperbola $\frac{x^2}{25}-\frac{y^2}{9}=1$, where θ is the parameter in its parametric form, then $2x_1+9\sin^2\theta=$

Options :

8

1. ✖

10

2. ✖

20

3. ✔

34

4. ✖

Question Number : 62 Question Id : 105615222 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the points A(1, 3, 5), B(2, 4, 6), C(4, 5, k) form a right angled triangle then the number of possible values of k is

Options :

1. ✔ 2

2. ✖ 3

3. ✖ 0

4. ✖ 1

Question Number : 63 Question Id : 105615223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $A=(3,4,0)$, $B=(4,4,4)$, $C=(-6,2,3)$ and $D=(1,1,2)$. If θ is the acute angle between the lines AB and CD then $\cos\theta =$

Options :

1. ✖ $\frac{4}{17\sqrt{3}}$

2. ✔ $\frac{3}{17\sqrt{3}}$

3. ✖ $\frac{12}{17\sqrt{3}}$

$\frac{11}{17\sqrt{3}}$

4. ✖

Question Number : 64 Question Id : 105615224 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

A plane containing two lines whose direction ratios are $(-1,2,1)$ and $(1,3,2)$ passes through the point $(2,1,k)$. If this plane also passes through the point $(3,-1,4)$, then $k=$

Options :

5

1. ✔

3

2. ✖

6

3. ✖

-3

4. ✖

Question Number : 65 Question Id : 105615225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let A$=(a_{ij})$ be an $n\times n$ matrix defined by $a_{ij}=\begin{cases}k^i, & \forall i=j\\ 0, & \text{otherwise}\end{cases}$. If $m=$ trace of A and $\lim\limits_{k\to 1}\frac{n-m}{1-k}=171$ then the value of n is

Options :

18

1. ✔

23

2. ✖

35

3. ✖

42

4. ✖

Question Number : 66 Question Id : 105615226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to\infty} x^3\left[\sqrt{x^2+\sqrt{x^4+1}}-\sqrt{2}x\right]=$$

Options :

0

1. ✖

1

2. ✖

$\frac{1}{4\sqrt{2}}$

3. ✔

$\frac{3}{2\sqrt{2}}$

4. ✖

Question Number : 67 Question Id : 105615227 Question Type : MCQ Option Shuffling : Yes Display Question Number :

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Let $f(x)=\begin{cases}3-x & \text{if} \quad x<-3 \\ 6 & \text{if} \quad -3\le x\le 3 \\ 3+x & \text{if} \quad x>3\end{cases}$. Let α be the number of points of discontinuity of f and β be the number of points where f is not differentiable. Then $\alpha+\beta=$

Options :

6

1. ✖

3

2. ✖

2

3. ✔

0

4. ✖

Question Number : 68 Question Id : 105615228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

If $a\,f(x)+b\,f\left(\frac{1}{x}\right)=x+1$, and $\frac{d}{dx}(x^2 f(x))=2x^2+2x+\frac{1}{3}$, then $a-b=$

Options :

2

1. ✖

3

2. ✔

0

3. ✖

1

4. ✖

Question Number : 69 Question Id : 105615229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $f(x)=\sin\left(\cos h\left(\frac{x^2+1}{x^2+2}\right)\right)$ then $f'(1)=$

Options :

$\frac{2}{9}\sin h\left(\frac{2}{3}\right)\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

1. ✔

$\sin h\left(\frac{2}{3}\right)\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

2. ✖

$\frac{2}{9}\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

3. ✖

$\frac{2}{9}\cos h\left(\frac{2}{3}\right)\cos\left(\sin h\left(\frac{2}{3}\right)\right)$

4. ✖

Question Number : 70 Question Id : 105615230 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If an error of 0.02 sq.cm is found in the surface area of a sphere when its radius is measured as 10 cm, then the approximate error that occurs in the volume of the sphere, in cubic centimetres, is

Options :

0.2

1. ✖

0.01

2. ✖

0.3

3. ✖

0.1

4. ✔

Question Number : 71 Question Id : 105615231 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If θ is the angle between the curves $y^2 = 4x$ and $x^2 + y^2 = 5$ then $|\tan\theta| =$

Options :

5

1. ✖

4

2. ✖

3

3. ✔

2

4. ✖

Question Number : 72 Question Id : 105615232 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The local maximum value of the function $f(x)=-(x-2)^3(x+2)^2$ is

Options :

0

1. ✖

$\frac{12^3 \cdot 8^2}{5^5}$

2. ✔

125

3. ✖

$\frac{2^9 \cdot 3^2}{5^6}$

4. ✖

Question Number : 73 Question Id : 105615233 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\int \frac{1+\cos 8x}{\tan 2x-\cot 2x}dx = f(x).\cos(g(x))+c$, then $f\left(\frac{1}{4}\right)+g\left(\frac{1}{4}\right)=$

Options :

2

1. ✖

$\frac{17}{8}$

2. ✖

$\frac{15}{8}$

3. ✖

$\frac{33}{16}$

4. ✔

Question Number : 74 Question Id : 105615234 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $x \neq \frac{-3}{5}, \frac{2}{5}$, if $f\left(\frac{2x+1}{5x+3}\right) = x+2$, then $\int f(x)\,dx =$

Options :

$\frac{7}{5}x - \frac{1}{5}\log|5x+3| + c$

1. ✖

$\frac{7}{5}x - \frac{1}{25}\log|5x+3| + c$

2. ✖

$\frac{7}{5}x - \frac{1}{25}\log|5x-2| + c$

3. ✔

$\frac{7}{5}x - \frac{1}{5}\log|5x-2| + c$

4. ✖

Question Number : 75 Question Id : 105615235 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\int e^x \cos x\,dx = \frac{e^x}{2}(\cos x + \sin x)$ and $\int \frac{\cos\left(\log\left(\frac{2x+3}{3-2x}\right)\right)}{(3-2x)^2}dx = \frac{f(x)}{24}\left[\cos(g(x)) + \sin(g(x))\right] + c$ then $g(1) =$

Options :

5

1. ✖

$\log f(2)$

2. ✖

$\log f(1)$

3. ✔

0

4. ✖

Question Number : 76 Question Id : 105615236 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$\int_1^2 x\sqrt{4-x^2}\;\;dx =$

Options :

$\sqrt{3}$

1. ✔

2

2. ✖

$\frac{1}{\sqrt{3}}$

3. ✖

$\frac{1}{2}$

4. ✖

Question Number : 77 Question Id : 105615237 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $[x]$ denotes the greatest integer function of x and $\int_{-3/2}^{3/2} [2x-3]\,dx = \mathrm{k}$, then $\left|\mathrm{k}+\frac{1}{2}\right| =$

Options :

7

1. ✖

8

2. ✖

10

3. ✔

12

4. ✖

Question Number : 78 Question Id : 105615238 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The differential equation corresponding to the family of curves given by $ax^2 + by^2 = 1$ where a and b are arbitrary constants is

Options :

$$x\frac{d^2y}{dx^2} = \frac{dy}{dx}$$

1. ✖

$$xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} = 0$$

2. ✔

$$xy\frac{d^2y}{dx^2} + y\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} = 0$$

3. ✖

$$xy\frac{d^2y}{dx^2} - x\left(\frac{dy}{dx}\right)^2 + y\frac{dy}{dx} = 0$$

4. ✖

Question Number : 79 Question Id : 105615239 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

For the differential equation $\sqrt{\frac{d^2y}{dx^2}} = \sqrt[3]{\left[y\frac{dy}{dx} + x\sin\left(\frac{dy}{dx}\right)\right]^2}$

Options :

Order is 2 and degree is 3

1. ✖

Order is 3 and degree is 3

2. ✖

Order is 3 and degree is 2

3. ✖

Order is 2 and degree is not defined

4. ✔

Question Number : 80 Question Id : 105615240 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation $\frac{dy}{dx}=\frac{xy+x-2y-2}{xy-2x+y-2}$ is

Options :

$x+y+3\log\left|\frac{x+1}{y+1}\right|=c$

1. ✖

$x+y+3\log\left|\frac{y+1}{x+1}\right|=c$

2. ✖

$x-y+3\log\left|\frac{x+1}{y+1}\right|=c$

3. ✖

$x-y+3\log\left|\frac{y+1}{x+1}\right|=c$

4. ✔

Physics