Vedantu JEE

ARVIND SUTHAR

IIT ROORKEE

5+ YEARS EXPERIENCE

“The Shortest Distance Between Two Points is a STRAIGHT LINE”

Q1. If the roots of the equation $ax^2 + bx + c = 0$ are in the ratio $m : n$, then

A $mn\, b^2 = ac(m + n)^2$

B $b^2 (m + n) = mn$

C $m + n = b^2mn$

D $mnc^2 = ab\, (m + n)^2$

Q1. If the roots of the equation $ax^2 + bx + c = 0$ are in the ratio m : n, then

A $mn\, b^2 = ac(m + n)^2$

B $b^2 (m + n) = mn$

C $m + n = b^2 mn$

D $mnc^2 = ab\, (m + n)^2$

Solution :

Let the roots are mr and nr

$$mr + nr = \frac{-b}{a} \Rightarrow r(m+n) = \frac{-b}{a} \text{ .... } (1)$$

and $mnr^2 = \frac{c}{a}$ .... (2)

Eliminating r, we get

$$b^2mn = ca(m+n)^2$$

Q2. The domain of definition of the function $y = 3e^{\sqrt{x^2-1}} \log(x-1)$ is

A $(1, \infty)$

B $[1, \infty)$

C $R - \{1\}$

D $(-\infty, -1) \cup (1, \infty)$

Q2. The domain of definition of the function $y = 3e^{\sqrt{x^2-1}} \log(x-1)$ is

A $(1, \infty)$

B $[1, \infty)$

C $R - \{1\}$

D $(-\infty, -1) \cup (1, \infty)$

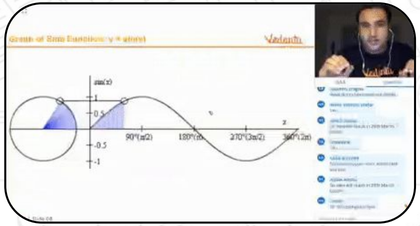
Solution :

$$x^2 - 1 \geq 0$$
$$\Rightarrow x^2 \geq 1$$
$$\Rightarrow x \in (-\infty, -1] \cup [1, \infty) \text{ ..... } (1)$$
and $x - 1 > 0$
$$\Rightarrow x > 1$$
$$\Rightarrow x \in (1, \infty) \text{ .... } (2)$$
From 1 and 2
$$x \in (1, \infty)$$


Vedantu Online Revolution
KAUN BOLA GHAR SE NAA HOPAYEGA?
AIR 41
CHIRAG JAIN
AIR 38
RAJDEEP SINGH
PwD AIR 1
SUMIT JAIN
JEE ADVANCED 2019 SUCCESS
3 in Top 50
ALL CATEGORIES

Features

01



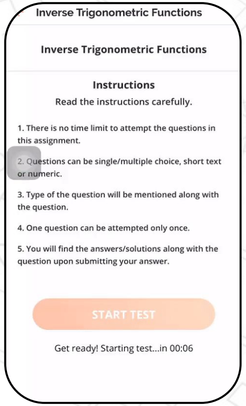
Learn

90+ live sessions by best teachers

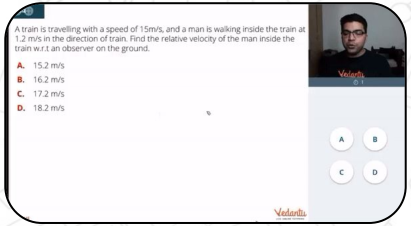
02

Test

20+ Comprehensive tests



03



Analyze

Assignments, Previous Year Question Papers, Mock Tests

04

Boost

Rank Booster Quizzes

05

Much More

Recorded sessions, Tips & Tricks

Batch Starts on:

1st JUNE 2020

How to Avail The Lightning Deal

1

Click on Enroll Now

2

Click on “I have a Coupon Code”

3

Apply Coupon “ASCC”

ENROLL NOW

Q3. The value of $\int_{-1}^{1} (x - [x])\, dx$ (where [.] denotes greatest integer function) is

A 0

B 1

C 2

D None of these

Q3. The value of $\int_{-1}^{1} (x - [x])\, dx$ (where [.] denotes greatest integer function) is

A 0

B 1

C 2

D None of these

Solution :

$$\int_{-1}^{1}(x-[x])dx = \int_{-1}^{1}x dx - \int_{-1}^{1}[x]dx$$

$$= \left[\frac{x^2}{2}\right]_{-1}^{1} - \left[\int_{-1}^{0}[x]dx + \int_{0}^{1}[x]dx\right]$$

$$= \frac{1}{2}[1-1] - \left[\int_{-1}^{0}[-1]dx + \int_{0}^{1}0.dx\right]$$

$$\begin{bmatrix} If\ -1 \le x < 0,\ [x] = -1 \\ If\ 0 \le x < 1,\ [x] = 0 \end{bmatrix}$$

$$= 0 - [-x]_{-1}^{0} - 0 = 0 - [-0-(-1)] = 1$$

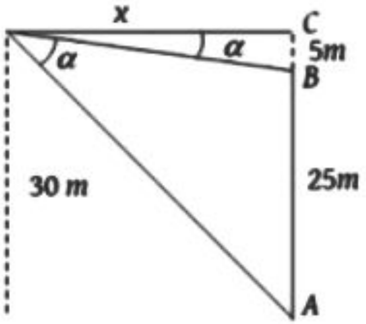
Q4. A flag - staff of 5 meters high stands on a building of 25 meters height. For an observer at a height of 30 meters, the flag-staff and the building subtend equal angles. The distance of the observer from the top of the flag - staff is

A $\frac{5\sqrt{3}}{2}m$

B $5\sqrt{\frac{3}{2}}m$

C $5\sqrt{\frac{2}{3}}m$

D None of these



Q4. A flag - staff of 5 meters high stands on a building of 25 meters height. For an observer at a height of 30 meters, the flag-staff and the building subtend equal angles. The distance of the observer from the top of the flag - staff is

A $\frac{5\sqrt{3}}{2}m$

B $5\sqrt{\frac{3}{2}m}$

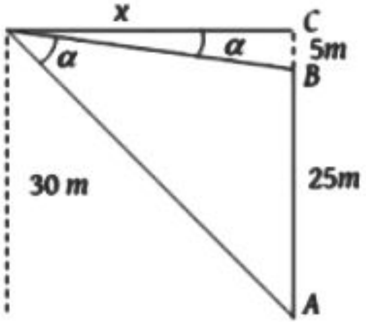
C $5\sqrt{\frac{2}{3}m}$

D None of these

Solution :

We have $\tan\alpha = \frac{5}{x}$ and $\tan 2\alpha = \frac{30}{x}$

$\therefore \quad \tan 2\alpha = \frac{30}{5\cot\alpha} \Rightarrow \tan 2\alpha = 6\tan\alpha$



Q5. If $R = \{(x, y) \mid x, y \in Z, x^2 + y^2 \leq 4\}$ is a relation in Z, then domain of R is

A $\{0, 1, 2\}$

B $\{0, -1, -2\}$

C $\{-2, -1, 0, 1, 2\}$

D None of these

Q5. If $R = \{(x, y) \mid x, y \in Z,\ x^2 + y^2 \leq 4\}$ is a relation in Z, then domain of R is

A {0, 1, 2}

B {0, -1, -2}

C {-2, -1, 0, 1, 2}

D None of these

Solution :

$$\because R = \{(x, y) \,|\, x, y \in Z,\ x^2 + y^2 \le 4\}$$

$$R = \left\{ \begin{array}{l} (-2, 0), (-1, 0), (0, -1), (-1, 1), \\ (1, -1), (0, -1), (0, 1), (0, 2), \\ (0, -2), (1, 0), (0, 1), (1, 1), \\ (-1, -1), (2, 0), (0, 0) \end{array} \right\}$$

Hence, Domain of

$$R = \{-2,\ -1,\ 0,\ 1,\ 2\}$$

Q6. If 5^{97} is divided by 52, then the remainder obtained is

A 3

B 5

C 4

D 0

Q6. If 5^{97} is divided by 52, then the remainder obtained is

A 3

B 5

C 4

D 0

Solution :

We know that, $5^4 = 625 = 52 \times 12 + 1$

$\Rightarrow 5^4 = 52\lambda + 1, \, where \, \lambda \, is \, a \, positive$ int $eger.$

$\Rightarrow (5^4)^{24} = (52\lambda + 1)^{24}$

$= {}^{24}C_0 \, (52\lambda)^{24}$ $(by$ binomial theorem)

$+ {}^{24}C_1 (52\lambda)^{23} + {}^{24}C_2 (52\lambda)^{22} + ...$

$+ {}^{24}C_{23} \, (52\lambda) + {}^{24}C_{24}$

$\Rightarrow 5^{96}$

$= 52 \left[{}^{24}C_0 52^{23} \lambda^{24} + {}^{24}C_1 52^{23} \lambda^{22} + ... + 1 \right]$

$= \left(\text{a multiple of } 52\right) + 1$

On multiplying both sides by 5, we get

$5^{97} = 5^{96} \, . \, 5 = 5 \, \left(\text{a multiple of } 52\right) + 5$

Hence, the required remainder is 5.

Q7. If $y = 4x - 5$ is tangent to the curve $y^2 = px^3 + q$ at (2,3) then (p,q) is

A (2, 7)

B (-2 , 7)

C (-2, -7)

D (2, -7)

Vedantu JEE

Q7. If $y = 4x - 5$ is tangent to the curve $y^2 = px^3 + q$ at $(2,3)$ then (p,q) is

A $(2, 7)$

B $(-2 , 7)$

C $(-2, -7)$

D $(2, -7)$

Solution :

Curve is $y^2 = px^3 + q$

$$\therefore 2y\frac{dy}{dx} = 3px^2$$

$$\Rightarrow \left(\frac{dy}{dx}\right)_{(2,3)} = \frac{3p.4}{2.3}$$

$$\Rightarrow 4 = 2p$$

$$\Rightarrow p = 2$$

Also, curve is passing through $(2, 3)$

$$\therefore 9 = 8p + q$$

$$\Rightarrow q = -7$$

$\therefore (p, q)$ is $(2, -7)$

Q8. The number of discontinuity of the greatest integer function $f(x) = [x], x \in \left(-\frac{7}{2}, 100\right)$ is equal to

A 104

B 102

C 101

D 103

Q8. The number of discontinuity of the greatest integer function $f(x) = [x], x \in \left(-\frac{7}{2}, 100\right)$ is equal to

A 104

B 102

C 101

D 103

Solution :

Given $, f\left(x\right)=\left[x\right], x\in\left(-3.5,100\right)$

As we know greatest integer is discontinous on integer values.

In given interval , the interger values are

$\left(-3,-2,-1,0,.....,99\right)$

$\therefore$ Total numbers of integers are 103.

Q9. The number of ways of selecting 15 teams from 15 men and 15 women, such that each team consists of a man and a woman, is

A 1960

B $15\,!$

C $(15\,!)^2$

D $14\,!$

Q9. The number of ways of selecting 15 teams from 15 men and 15 women, such that each team consists of a man and a woman, is

A 1960

B 15 !

C $(15\,!)^2$

D 14 !

Q10. If the general solution of the differential equation $y' = \frac{y}{x} + \varphi\left(\frac{x}{y}\right)$, for some function Φ, is given by yln|cx| = x where c is an arbitrary constant, then $\varphi(2)$ is equal to $\left(here,\ y' = \frac{dy}{dx}\right)$

A -4

B $-\frac{1}{4}$

C $\frac{1}{4}$

D 4

Q10. If the general solution of the differential equation $y' = \frac{y}{x} + \varphi\left(\frac{x}{y}\right)$, for some function Φ, is given by yln|cx| = x where c is an arbitrary constant, then $\varphi(2)$ is equal to $\left(here,\ y' = \frac{dy}{dx}\right)$

A -4

B $-\frac{1}{4}$

C $\frac{1}{4}$

D 4

Solution :

$$given\ :\ y' = \frac{y}{x} + \varphi\left(\frac{x}{y}\right)$$

$$As$$

$$y\ln(cx) = x \Rightarrow y'\ln(cx) + y\frac{1}{cx}c = 1$$

$$\Rightarrow y'\left(\frac{x}{y}\right) + \frac{y}{x} = 1$$

$$\Rightarrow \frac{1-\left(\frac{y}{x}\right)}{\left(\frac{x}{y}\right)} = \left(\frac{y}{x}\right) + \varphi\left(\frac{x}{y}\right)$$

$$x = 2,\ y = 1 \Rightarrow \frac{1-\left(\frac{1}{2}\right)}{\left(\frac{2}{1}\right)} = \left(\frac{1}{2}\right) + \varphi\left(\frac{2}{1}\right)$$

$$\Rightarrow \varphi(2) = -\frac{1}{4}$$

Q11. If $\sin^{-1}\frac{1}{3} + \sin^{-1}\frac{2}{3} = \sin^{-1} x$, then the value of x is

A 0

B $\frac{(\sqrt{5} - 4\sqrt{2})}{9}$

C $\frac{(\sqrt{5} + 4\sqrt{2})}{9}$

D $\frac{\pi}{2}$

Q11. If $\sin^{-1}\frac{1}{3}+\sin^{-1}\frac{2}{3}=\sin^{-1}x$, then the value of x is

A 0

B $\frac{(\sqrt{5}-4\sqrt{2})}{9}$

C $\frac{(\sqrt{5}+4\sqrt{2})}{9}$

D $\frac{\pi}{2}$

Solution :

Given that, $\sin^{-1}\frac{1}{3} + \sin^{-1}\frac{2}{3} = \sin^{-1} x,$

Taking sine on both sides

$$\Rightarrow \left(\frac{1}{3}\sqrt{1-\frac{4}{9}} + \frac{2}{3}\sqrt{1-\frac{1}{9}}\right) = x$$

$$\Rightarrow \left(\frac{1}{3}.\frac{\sqrt{5}}{3} + \frac{2}{3}.\frac{\sqrt{8}}{3}\right) = x$$

$$\Rightarrow \left(\frac{\sqrt{5}+4\sqrt{2}}{9}\right) = x$$

$$\therefore x = \left(\frac{\sqrt{5}+4\sqrt{2}}{9}\right)$$

Q12. If x and y are two distinct integers and n is a natural number than $x^n - y^n$ is divisible by

A $x^2 - y^2$

B $x + y$

C $x - y$

D None of these

Q12. If x and y are two distinct integers and n is a natural number than $x^n - y^n$ is divisible by

A $x^2 - y^2$

B $x + y$

C $x - y$

D None of these

Solution :

$P(n) \ : x^n - y^n$ where $n \in N$

Then, $P(1) \ : x - y$ is divisible $x - y$

$P(2) \ : x^2 - y^2$ is divisible $x - y$

$P(3) \ : x^3 - y^3$ is divisible $x - y$

Hence $x^n - y^n$ is divisible $x - y$

Q13. Number of roots of the equation $\cos^2 x + \frac{\sqrt{3}+1}{2}\sin x - \frac{\sqrt{3}}{4} - 1 = 0$ which lie in the interval [-π, π] is

A 2

B 4

C 6

D 8

Q13. Number of roots of the equation $\cos^2 x + \frac{\sqrt{3}+1}{2}\sin x - \frac{\sqrt{3}}{4} - 1 = 0$ which lie in the interval [-π, π] is

A 2

B 4

C 6

D 8

Solution :

Given equation is

$$1-\sin^2 x+\frac{\sqrt{3}+1}{2}\sin x-\frac{\sqrt{3}}{4}-1=0$$

$$\Rightarrow \sin^2 x-\frac{\sqrt{3}+1}{2}\sin x+\frac{\sqrt{3}}{4}=0;$$

$$4\sin^2 x-2\sqrt{3}\sin x-2\sin x+\sqrt{3}=0$$

$$2\sin x\left(2\sin x-\sqrt{3}\right)-\left(2\sin x-\sqrt{3}\right)=0$$

$$\Rightarrow \left(2\sin x-1\right)\left(2\sin x-\sqrt{3}\right)=0$$

On solving we get $\sin x=\frac{1}{2};\ \frac{\sqrt{3}}{2}$

$$x=\frac{\pi}{6},\ \frac{5\pi}{6};\ \frac{\pi}{3},\ \frac{2\pi}{3}$$

Q14. Suppose that side lengths of a triangle are three consecutive integers and one of the angles is twice another. The number of such triangles is/are

A 1

B 0

C 4

D 2

Q14. Suppose that side lengths of a triangle are three consecutive integers and one of the angles is twice another. The number of such triangles is/are

A 1

B 0

C 4

D 2

Solution :

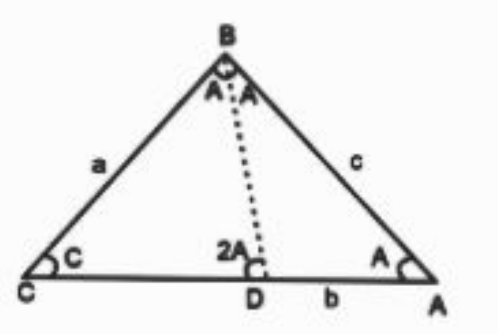
Let $B = 2A$ and BD be the bisector of angle

B, *then*

$CD = \frac{ab}{a+c}$ & $AD = \frac{bc}{a+c}$

Now, ΔABC *and* ΔBDC *are similar*,

So



$\frac{BC}{AC} = \frac{CD}{BC} \Rightarrow a^2 = \frac{ab}{a+c} b \Rightarrow b^2 \ldots\ldots (i)$

$= a(a+c)$

Since, $b > a \Rightarrow$ Either $b = a + 1$ *or*

$b = a + 2$, *if* $b = a + 1$, then [From Eq. (i)]

$(a+1)^2 = (a+c)a \Rightarrow c = 2 + \frac{1}{a}$

c is integer $\Rightarrow a = 1,\ b = 2,\ c = 3$ *but then*,

no triangle will form.

If $b = a + 2$. then obviouslv $c = a + 1$.

$(a+2)^2 = a(2a+1)$

$\Rightarrow a^2 - 3a - 4 = 0$ or $a = 4$

$\therefore a = 4,\ b = 6,\ c = 5$ is the only possible solution.

Q15. If $x = 33^n$, n is a positive integral value, then the probability that x will have 3 at its units place is

A $\frac{1}{3}$

B $\frac{1}{4}$

C $\frac{1}{5}$

D $\frac{1}{2}$

Q15. If $x = 33^n$, n is a positive integral value, then the probability that x will have 3 at its units place is

A $\frac{1}{3}$

B $\frac{1}{4}$

C $\frac{1}{5}$

D $\frac{1}{2}$

Solution :

Given that, $x = 33^n$

Where, n is a positive integral value.

Here, only four digits may be at the unit place $ie.$, $1, 3, 7, 9.$

$\therefore\ n(S) = 4$

Let E be the event of getting 4 at its units place.

$\therefore\ n(E) = 1$

$\therefore\ P(E) = \frac{n(E)}{n(S)} = \frac{1}{4}$

Q16. The area bounded by the curves $y = (x-1)^2$, $y = (x+1)^2$ and $y = \frac{1}{4}$ is

A $\frac{1}{3}$ sq unit

B $\frac{2}{3}$ sq unit

C $\frac{1}{4}$ sq unit

D $\frac{1}{5}$ sq unit

Q16. The area bounded by the curves $y=(x-1)^2$, $y=(x+1)^2$ and $y=\frac{1}{4}$ is

A $\frac{1}{3}$ sq unit

B $\frac{2}{3}$ sq unit

C $\frac{1}{4}$ sq unit

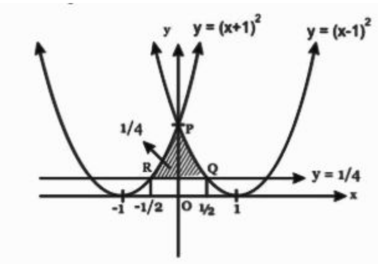
D $\frac{1}{5}$ sq unit

Solution :

The curves

$y = (x-1)^2, \; y = (x+1)^2$ *and*

$y = \frac{1}{4}$ are shown as



where point of intersection are

$(x-1)^2 = \frac{1}{4}$

$\Rightarrow x = \frac{1}{2}$

$and\,(x+1)^2 = \frac{1}{4} \Rightarrow x = -\frac{1}{2}$

$\therefore\; Q\left(\frac{1}{2}, \frac{1}{4}\right)\; and\, R\left(-\frac{1}{2}, \frac{1}{4}\right)$

$\therefore$ Required area

$$= 2\int_0^{\frac{1}{2}} \left[(x-1)^2 - \frac{1}{4}\right] dx = 2\left[\frac{(x-1)^2}{3} - \frac{1}{4}x\right]_0^{\frac{1}{2}}$$

$$= 2\left[-\frac{1}{8.3} - \frac{1}{8} - \left(-\frac{1}{3} - 0\right)\right] = \frac{8}{24}$$

$= \frac{1}{3}$ sq unit

Q17. If $y = \log_{10} x + \log_x 10 + \log_x x + \log_{10} 10$, then $\frac{dy}{dx}$ is equal to

A $\frac{1}{x \log_e 10} - \frac{\log_e 10}{x(\log_e x)^2}$

B $\frac{1}{x \log_e 10} - \frac{1}{x \log_{10} e}$

C $\frac{1}{x \log_e 10} - \frac{\log_e 10}{x\,(\log_e x)}$

D None of these

Q17. If $y = \log_{10} x + \log_x 10 + \log_x x + \log_{10} 10$, then $\frac{dy}{dx}$ is equal to

A $\frac{1}{x \log_e 10} - \frac{\log_e 10}{x(\log_e x)^2}$

B $\frac{1}{x \log_e 10} - \frac{1}{x \log_{10} e}$

C $\frac{1}{x \log_e 10} - \frac{\log_e 10}{x\,(\log_e x)}$

D None of these

Solution :

$$y = \log_{10} x + \log_x 10 + \log_x x + \log_{10} 10$$

$$= \log_{10} x + \frac{\log_e 10}{\log_e x} + 1 + 1$$

$$\Rightarrow \frac{dy}{dx} = \frac{1}{x} \log_{10} e - \frac{\log_e 10}{x(\log_e x)^2}$$

Q18. z ∈ C satisfies the condition |z| ≥ 3. Then the least value of $\left|z+\frac{1}{z}\right|$ is

A $\frac{3}{8}$

B $\frac{8}{5}$

C $\frac{8}{3}$

D $\frac{5}{8}$

Q18. $z \in C$ satisfies the condition $|z| \geq 3$. Then the least value of $\left|z + \frac{1}{z}\right|$ is

A $\frac{3}{8}$

B $\frac{8}{5}$

C $\frac{8}{3}$

D $\frac{5}{8}$

Solution :

From triangle inequality we know that

$$|z_1 + z_2| \geq ||z_1| - |z_2||$$

Hence

$$\left|z + \frac{1}{z}\right| = \left|z - \left(-\frac{1}{z}\right)\right| \geq \left||z| - \left|-\frac{1}{z}\right|\right|$$

$$\geq 3 - \frac{1}{3} = \frac{8}{3}$$

Hence $\frac{8}{3}$ is the correct answer

Q19. If a,b,c,d,e,f, are in arithmetic progression. Then e - c is equal to

A $2(c - a)$

B $2(d - c)$

C $2(f - d)$

D $d - c$

Q19. If a,b,c,d,e,f, are in arithmetic progression. Then e - c is equal to

A $2(c - a)$

B $2(d - c)$

C $2(f - d)$

D $d - c$

Solution :

a,b,c,d,e, f are in A.P.

Let common difference = D

$$\therefore e - c = (a + 4D) - (a + 2D) = 2D$$

$$= 2\,(d - c)$$

Q20. $\int \frac{\ln (x+1)-\ln x}{x(x+1)} dx$ is equal to (where C is an arbitrary constant)

A $-\frac{1}{2}\left[\ln\left(\frac{x+1}{x}\right)\right]^2 + C$

B $C - \left[\{\ln (x+1)\}^2 - (\ln x)^2\right]$

C $-\ln\left[\ln\left(\frac{x+1}{x}\right) + C\right]$

D $-\ln\left(\frac{x+1}{x}\right) + C$

Q20. $\int \frac{\ln(x+1)-\ln x}{x(x+1)}dx$ is equal to (where C is an arbitrary constant)

A $-\frac{1}{2}\left[\ln\left(\frac{x+1}{x}\right)\right]^2 + C$

B $C - \left[\{\ln(x+1)\}^2 - (\ln x)^2\right]$

C $-\ln\left[\ln\left(\frac{x+1}{x}\right) + C\right]$

D $-\ln\left(\frac{x+1}{x}\right) + C$

Solution :

$$put \ln(x+1) - \ln x = t$$

$$\Rightarrow \frac{1}{x+1} - \frac{1}{x} = \frac{dt}{dx} \Rightarrow \frac{x(x+1)}{x(x+1)} = \frac{dt}{dx}$$

$$\Rightarrow \frac{-dx}{x(x+1)} = dt \Rightarrow \frac{dx}{x(x+1)} = -dt$$

so question becomes

$$-\int t \ dt = -\frac{t^2}{2} + C$$

Q21. If f(x) is a polynomial satisfying

$$f(x)\, f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right) \text{ and } f(2) > 1, \text{ then } \lim_{x\to 1} f(x) \text{ is}$$

Solution :

As given $f(x)\cdot f\left(\frac{1}{x}\right)=f(x)+f\left(\frac{1}{x}\right)\cdot f(2)$,

$\Rightarrow f(x)f\left(\frac{1}{x}\right)-f(x)-f\left(\frac{1}{x}\right)=0$

$\Rightarrow (f(x)-1)\left(f\left(\frac{1}{x}\right)-1\right)=1$

$\Rightarrow h(x)h\left(\frac{1}{x}\right)=1$ as it $f(x)$ is a polynomial, hence $h(x)$

will also be a polynomial $\Rightarrow h(x)=\pm x^n$

$\Rightarrow f(x)=\pm x^n+1$

Hence $f(x)=\pm x^n+1$

Now $f(2)>1 \Rightarrow f(x)=x^n+1$

hence $\lim\limits_{x\to1} f(x)=\lim\limits_{x\to1}(x^n+1)=2$

Q22. If

$$A=\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 1\\ 0 & -2 & 4\end{bmatrix}, I=\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix} \text{ and } A^{-1}=\frac{1}{6}\left(A^2+cA+d\right)$$

then the sum of values of c and d is

Solution :

We evaluate A^2 and A^3 and write the given equation as

$$AA^{-1} = I = \frac{1}{6}\left[A^3 + cA^2 + dA\right].$$

Comparing the corresponding elements on both the sides,

we get $c = -6,\ d = 11.$


Vedantu
Learn LIVE Online
INTRODUCING
QUIZ
A LIVE
Online Quiz
like never before!
Score. Learn. Earn
Prize pool
upto Rs 50k
Get Paytm
Cashback
Download the App Now

Q23. The least value of the quadratic polynomial, $f(x) = (2p^2 + 1)x^2 + 2(4p^2 - 1)x + 4(2p^2 + 1)$ for real values of p and x is

Solution :

$$y = 2p^2\left(x^2 + 4x + 4\right) + x^2 - 2x + 1 + 3$$

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

$$p = 0,\ x = 1$$

$$y_{\min} = 3$$

Q24. If A, B, C are in arithmetic progression and B = $\frac{\pi}{4}$, then tanA tan B tan C=

Solution :

$\because$ Angle A, B, C are in arithmetic progession

and $\angle B = \frac{\pi}{4}$ then $A = \frac{\pi}{4} - \theta \; C = \frac{\pi}{4} + \theta$

Hence $\tan\left(\frac{\pi}{4} - \theta\right) \tan\frac{\pi}{4} \tan\left(\frac{\pi}{4} + \theta\right)$

$$= \frac{1-\tan\theta}{1+\tan\theta} \cdot 1 \cdot \frac{1+\tan\theta}{1-\tan\theta} = 1$$

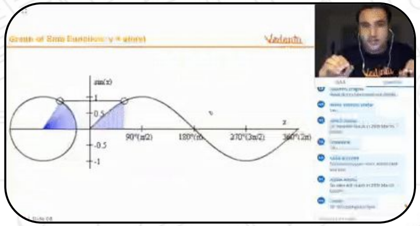
Vedantu Online Revolution
KAUN BOLA GHAR SE NAA HOPAYEGA?
AIR 41
CHIRAG JAIN
AIR 38
RAJDEEP SINGH
PwD AIR 1
SUMIT JAIN
JEE ADVANCED 2019 SUCCESS
3 in Top 50
ALL CATEGORIES

Features

01

Learn

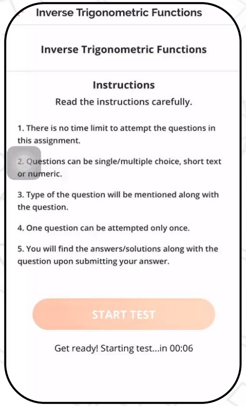
90+ live sessions by best teachers



02

Test

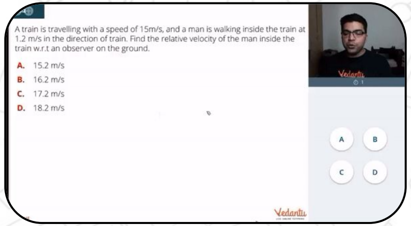
20+ Comprehensive tests



03

Analyze

Assignments, Previous Year Question Papers, Mock Tests



04

Boost

Rank Booster Quizzes

05

Much More

Recorded sessions, Tips & Tricks

Batch Starts on:

1st JUNE 2020

How to Avail The Lightning Deal

1. Click on Enroll Now

2. Click on "I have a Coupon Code"

3. Apply Coupon "ASCC"

ENROLL NOW

Q25. The distance of the point (-1, 1) from the line $12(x + 6) = 5(y - 2)$ is

Solution :

The given line is $12(x+6)=5(y-2)$

$\Rightarrow 12x-5y+82=0$

The perpendicular distance from (x_1, y_1) to

the line $ax+by+c=0$ is $\frac{(ax_1+by_1+c)}{\sqrt{a^2+b^2}}$

The point (x_1, y_1) is $(-1,1)$, therefore,

perpendicular distance $(-1,1)$ to the line

$12x-5y+82=0$ is

$$=\frac{|12-5+82|}{\sqrt{12^2+(-5)^2}}=\frac{65}{\sqrt{144+25}}=\frac{65}{\sqrt{169}}$$

$$=\frac{65}{13}=5$$

Vedantu JEE

CRACK JEE

LIKE SHARE SUBSCRIBE

#LearningWon'tStop