

India's Number 1 Education App

MATHS

BOOKS - UNITED BOOK HOUSE

SET 12



1. The value of $\sin^{-1}\cos 150^\circ$ is.....

A.
$$\frac{\pi}{3}$$

B.
$$-\frac{\pi}{3}$$

C. $\frac{2\pi}{3}$
D. $\frac{-2\pi}{3}$



2. If a square matrix A is equal to its transpose A^T , then A^T is called a

A. symmetric

B. identify

C. skew symmetric

D. none of these.

Answer:

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3. The points of discontiuties of the function $f(x)=rac{x+2}{2x^2-x-1}$ are: A. $rac{1}{2},\ -1$

B.
$$-\frac{1}{2}, -1$$

C. $1, -\frac{1}{2}$
D. $\frac{1}{2}, 1$

4. The value of
$$\int e^{-rac{1}{x}} rac{.1}{x^2} dx$$
 is.....

A.
$$rac{1}{x}e^{-rac{1}{x}}+c$$

B. $-rac{1}{x}e^{-rac{1}{x}}+c$

$$\mathsf{C.}\,e^{-\frac{1}{x}}+c$$

$$\mathsf{D.} - e^{-\frac{1}{x}} + c.$$



5. The value of p for which the vectors $p\hat{i} - 5\hat{j}$ and $2\hat{i} - 3\hat{j}$ are collinear is

A.
$$\frac{5}{3}$$

B. $\frac{10}{3}$

C. 10

D. 1

Answer:



6. The angle between the lines whose direction ratios are proportional to 1, -2, 1 and 4, 3, 2 is.....

A.
$$\frac{3\pi}{4}$$

B. $\frac{\pi}{2}$

C.
$$\frac{\pi}{3}$$

D. $\frac{\pi}{4}$



7. An unbiased coin is tossed three times in succession, then the probability of getting exactly one head is

A.
$$\frac{1}{2}$$

B. $\frac{5}{8}$

C.
$$\frac{3}{4}$$

D. $\frac{3}{8}$



8. The probability density function of a random variable X is f(x) = $k(x-1)^2$, $1 \le x \le 2$. The

value of the constant K is

A. 3

B.4

C. 5

D. 6

Answer:



9. Solve:
$$\sin^{-1} \cos \left(\sin^{-1} x \right) = \frac{\pi}{3}.$$

10. If A = $\begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix}$, show that $A^2 = 10A + I$ where I is the unit matrix of order 2. Watch Video Solution 11. Prove that, $\lim_{x \to 0} \frac{\log \cos x}{\sin^2 x} = -\frac{1}{2}$ Watch Video Solution -0

12. If y =
$$an^{-1}(\sec x + \tan x)$$
, find $rac{d^2y}{dx^2}$.

13. Prove that,
$$\int\limits_{a}^{b} f(a+b-x) dx$$
= $\int\limits_{a}^{b} f(x) dx$

14. Solve:
$$2^{x-y}dx + 2^{y-x}dy$$
 = 0

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15. If $x > \frac{1}{2}$, show that the function f(x) = $x(4x^2 - 3)$ is steadily increasing.



16. Find the area in the fourth quadrant bounded by the curve $y = x^3 - 8$ and the coordinate axes.

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17. Can the numbers 1,2,3 be the direction ratio

of a straight line? Give reason.

18. Find the intercept form of a plane with intercepts 2,3 and 4 on the x,y and z-axis respectively.

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19. A and B are two independent events with
$$P(A) = \frac{2}{5}$$
 and $P(B) = \frac{1}{3}$, evaluate $P(A \cup B)$.

20. The mean and variance of a binomial distribution are 4 and 3 respectively. Find the values of its parameters.

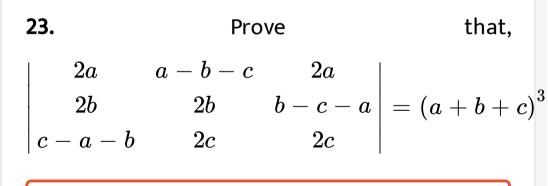
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21. If $\tan^{-1} x$, $\tan^{-1} y$ and $\tan^{-1} z$ are in A.P, find the algebric relation between x,y and z. If x,y,z be also in A.P. then show that $x = y = z(y \neq 0)$.

22. Prove that, the inverse of a given square

matrix, if its exists, is unique.







24. If
$$\sqrt{1-x^2}+\sqrt{1-y^2}$$
 = a(x-y), show that, $rac{dy}{dx}=\sqrt{rac{1-y^2}{1-x^2}}$

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25. Evaluate:
$$\int \frac{x dx}{(x^2 - a^2)(b^2 - x^2)} (b^2 > a^2).$$

26. Evaluate:

$$\int\!\!rac{\sqrt{x}dx}{\sqrt{a^3-x^3}}$$

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27. Solve:
$$\frac{dy}{dx} - \frac{y}{x} + \cos ec(\frac{y}{x})$$
=0, given y = 0

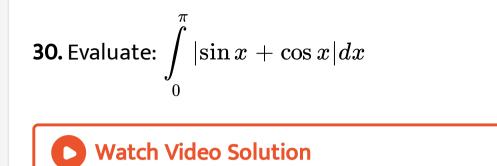
when x = 1

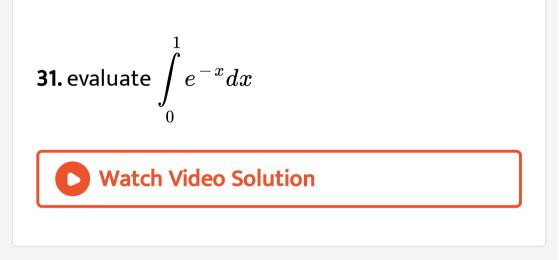
28. Solve:
$$y^2 + \left(x - \frac{1}{y}\right) \frac{dy}{dx} = 0.$$



29. The position vectors of the points A and B are $2\overrightarrow{a} + \overrightarrow{b}$ and $\overrightarrow{a} - 3\overrightarrow{b}$. If the point C divides the line segment \overline{AB} externally in the ratio 1:2, then find the position vector of the point C. Show also that A is the midpoint of the line segment \overline{CB} .







32. A packet, of 10 electronic components is known to include 3 defectives. If 4 componenets

are randomly chosen and tested, what is the probability of finding not more than one defective in the packet?

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33. A random variable x follows binomial distribution with mean 3 and standard deviation $\sqrt{2}$ Find the value of P(x = 2) and $P(x \le 1)$.

34. (b)answer any two questions : (i) a circular ink blot grows at the rate of $2c \frac{m^2}{\sec}$.find the rate at which the radius is increasing after $2\left(\frac{6}{11}\right)\sec onds$ **Vatch Video Solution**

35. answer any two questions :(iii) if the straight line lx+my=n be a normal to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, then by the application of calculus prove that $\frac{a^2}{l^2} - \frac{b^2}{m^2} = \frac{(a^2 + b^2)^2}{n^2}$.



36. Find the vector equation of a line which passes throught the point with position vector $\hat{i} - 2\hat{j} + 4\hat{k}$ and is in the direction of $\hat{i} + 2\hat{j} - \hat{k}$. Also reduce it to cartesian form.

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37. Let \overrightarrow{n} be a vector of magnitude $2\sqrt{3}$ such that it makes equal acute angles with the coordinate axes. Find the vectore and cartesian

forms of the equation of a plane passing

throught (1,-1,2) and normal to \overrightarrow{n} .

