



MATHS

BOOKS - UNITED BOOK HOUSE

SET 3



1.
$$\cos^{-1}\left(\frac{1}{2}\right) + 2\sin^{-1}\left(\frac{1}{2}\right)$$
 is equal to
A. $\frac{\pi}{4}$
B. $\frac{\pi}{6}$

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

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

Answer:



2. If A is a square matrix, then $A+A^{\,\prime}$ is

A. unit matrix

B. null matrix

C. A

D. symmetric matrix.

Answer:



3. If f(x) = logx, then
$$\frac{d}{dx}f(\log x)$$
 =

A.
$$\frac{1}{x}$$
. $\log x$

$$\mathsf{B}.\,\frac{x}{\log x}$$

$$\mathsf{C}.\,\frac{1}{x\log x}$$

Answer:

4. If f(2a-x)=-f(x), then
$$\int_{0}^{2a} f(x)dx$$
=

A. 0

B. f(2a)

C. f(0)

D. f(2a)

Answer:



5. If a particle moves along the parabola $y^2=8x$ then the co-ordinates of the point on which the rate of change of abscissa is equal to the rate of change of ordinate, is

A. (4,2)

B. (2,4)

C. (2,2)

D. (4,4)

Answer:

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6. $i. (j \times k) + j. (i \times k) + k. (i \times j)$ =

B. 2

C. 3

D.-3

Answer:

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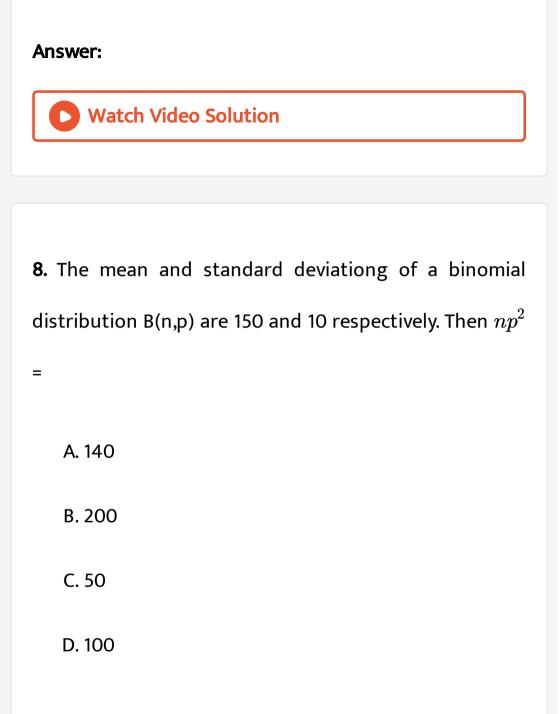
7. P(A) = 0.6,P(B) = 0.3,
$$P(B \, / \, A) = 0.2 m P(A \cup B)$$
=

A. 0.84

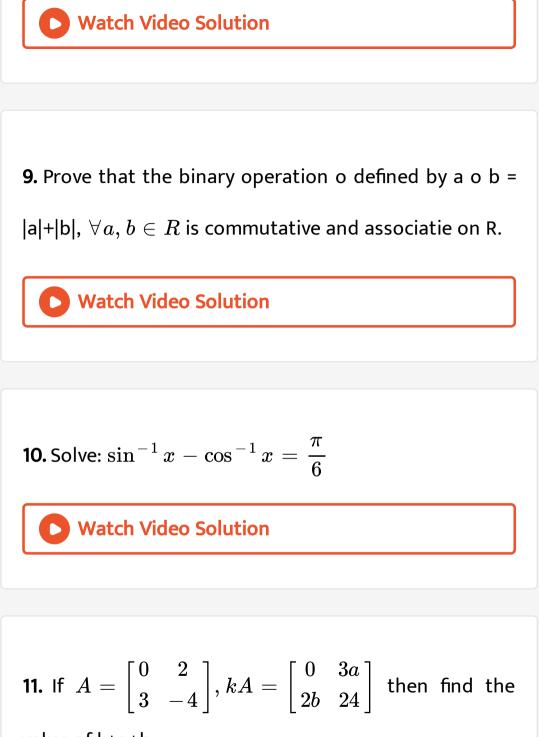
B. 0.78

C. 0.12

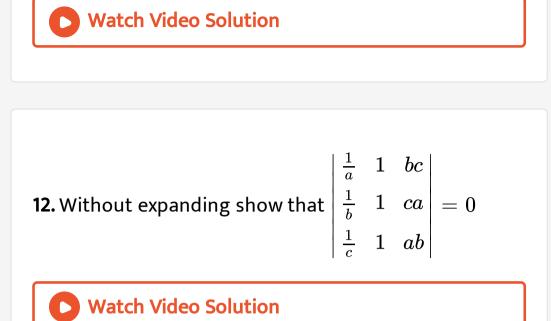
D. 0.7

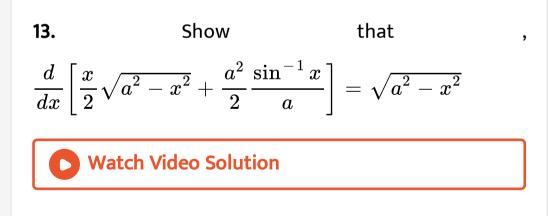


Answer:



value of k+a+b.





14. Evaluate the following integral:

$$\int (\tan^{-1}) \sqrt{\frac{1-\sin x}{1+\sin x}} dx$$

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15. Find the value of C that occurs in the conclusion of

largranges's MVT in the function $f(x) = x^2 - 2x + 3$

in [-2,2].



16. Solve the following differential equations:

$$rac{dy}{dx}=e^{x+y}+x^2e^y$$



17. If
$$\left| \overrightarrow{a} + \overrightarrow{b} \right| = \left| \overrightarrow{a} - \overrightarrow{b} \right|$$
, (where \overrightarrow{a} and \overrightarrow{b} are any vector) then show that \overrightarrow{a} and \overrightarrow{b} are perpendicular to each other.

18. The cartesian equations of a line are x= ay+b,z= cy+d

. Find its direction ratios.



19. Events A and B are such that $P(A) = \frac{1}{2}$, $P(B) = \frac{7}{12}$ and $P(\text{not A or not B}) = \frac{1}{4}$.

State whether A and B are independent?

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20. A binomial distribution B(n,p) has the mean 8 and variance $\frac{8}{3}$. Find the values of n and p.

21. Show that

$$\cos^{-1}\left(\frac{\cos x + \cos y}{1 + \cos x \cdot \cos y}\right) = 2\tan^{-1}\left(\tan\left(\frac{x}{2}\right) \cdot \tan\left(\frac{y}{2}\right)\right)$$



22. By row transformation find inverse of the matrix

$$A = egin{bmatrix} 1 & 3 & 2 \ -3 & -3 & -1 \ 2 & 1 & 0 \end{bmatrix}$$

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23. Show that,
$$A=rac{1}{3} egin{bmatrix} 1&2&2\\2&1&-2\\-2&2&-1 \end{bmatrix}$$
 are orthogonal

matrix and hence find A^{-1} .

24. Prove that,
$$\begin{vmatrix} (a+1)(a+2) & a+2 & 1 \ (a+2)(a+3) & a+3 & 1 \ (a+3)(a+4) & a+4 & 1 \end{vmatrix} = -2$$

25. If
$$y = 3e^{2x} + 2e^{3x}$$
 then show that

$$y_2 - 5y_1 + 6y = 0$$

26. If
$$x = \sqrt{a^{\sin^{-1}t}}$$
 and $y = \sqrt{a^{\cos^{-1}t}}$ show that $\frac{dy}{dx} = -\frac{y}{x}.$

27. Evaluate:
$$\int \frac{\sin^{-1} x}{x^2 dx}$$

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28. Evaluate: $\int \frac{dx}{x(x^n + 1)}$
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29. Solve:
$$rac{dy}{dx}+rac{y}{x}=e^x$$

30. Solve:
$$rac{dy}{dx}=rac{2x+3y}{3x+2y}$$

31. If
$$\overrightarrow{a} = \hat{i} + \hat{j} + \hat{k}$$
, $\overrightarrow{b} = \hat{i} + \hat{j}$, $\overrightarrow{c} = \hat{i}$ and $\left(\overrightarrow{a} \times \overrightarrow{b}\right) \times \overrightarrow{c} = \lambda \overrightarrow{a} + \mu \overrightarrow{b}$. Then show that $\lambda + \mu = 0$

32. If
$$\overrightarrow{a} = \hat{i} + \hat{j} - \hat{k}$$
, $\overrightarrow{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\overrightarrow{c} = -\hat{i} + 2\hat{j} - \hat{k}$, then show that the unit vector perpendicular to $\overrightarrow{a} + \overrightarrow{b}$ and $\overrightarrow{b} + \overrightarrow{c}$ is \hat{k} .



33. Prove that
$$\displaystyle{\int\limits_{-2}^{2}} ig| 1-x^2 ig| dx = 4$$

34. Evaluate (with the help of definite integral)

$$\lim_{n o\infty} \left[rac{1}{\sqrt{n}} + rac{1}{\sqrt{2n}} + rac{1}{\sqrt{3n}} + \ldots + rac{1}{n}
ight]$$

35. If two dice are rolled 12 times, obtain the mean and variance of the distribution of successes, if getting a total greater than 4 is considered a success.

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36. Find the equation to the curve passing through (2,2) and having its slope $\left(-\frac{x+y}{x}\right)$ at the point (x,y)
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37. Find the area of the parallelogram whose two adjacent sides are 3i+4j and 5i+7j+2k.



38. The foot of the perpendicular drawn from the origin

0 to a plane is N(12,-4,-3). Find the equaion of the plane

in cartesian form and vector form.

