



MATHS

BOOKS - PREMIERS PUBLISHERS

EXAMINATION QUESTION PAPER MARCH 2019



1.
$$\int \frac{\sec x}{\sqrt{\cos 2x}} dx$$
 is

A.
$$an^{-1}(\cos x) + c$$

$$\mathsf{B}.\sin^{-1}(\tan x) + c$$

$$\operatorname{\mathsf{C.}} \tan^{-1}(\sin x) + c$$

D.
$$2\sin^{-1}(\tan x) + c$$

Answer:

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2. It is given that the events A and B are such

that

$$P(A) = rac{1}{4}, P(A \, / \, B) = rac{1}{2} \, ext{ and } \, P(B \, / \, A) = rac{2}{3}$$

. Then P(B) is

A.
$$\frac{2}{3}$$

B. $\frac{1}{2}$
C. $\frac{1}{6}$
D. $\frac{1}{3}$

Answer:

3. If
$$A = \left\{ \frac{x,y}{y} = e^x . \ x \in [0,\infty) \right\}$$
 and $B = \left\{ \frac{x,y}{y} = \sin x, x \in [0,\infty) \right\}$ then

n(AcapB)` is?

A. ∞

B. 1

 $\mathsf{C}.\,\phi$

D. 0

Answer:



4. If
$$f(x) = \left\{ egin{array}{ccc} 2a-x, & ext{for} & -a < x < a \ 3x-2a, & ext{for} & x \geq a \end{array}
ight.$$

then which of the following is true?

- A. f(x) is continuous for all x in R
- B. f(x) is differentiable for all $x \ge a$
- C. f(x) is not differntiable at x=a
- D. f(x) is discontinuous at x=a

Answer:

5. A number is selected from the set $\{1, 2, 3, \ldots, 20\}$. The probability That the selected number is divisible by 3 or 4 is

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

B. $\frac{2}{3}$
C. $\frac{2}{5}$
D. $\frac{1}{8}$

Answer:



6. The value of x, for which the matrix A =

 $\left[egin{array}{ccc} e^{x-2} & e^{7+x} \ e^{2+x} & e^{2x+3} \end{array}
ight]$ is singular is

A. 7

B. 6

C. 9

D. 8

Answer:

7. The number of five digit numbers in which

all digits are even, is?

A. $4 imes 5^4$

 $\text{B.}\,4\times5^5$

C. 5^{5}

D. 5 imes 5

Answer:

- **8.** If $|x+2| \leq 8$, then x belongs to?
 - A. (6,10)
 - B. (-10,6)
 - C. [-6,10]
 - D. [-10,-6]

Answer:



9. The n^{th} term of the sequence 2, 7, 14, 23, is:

A.
$$n^2 + 2n + 1$$

$$\mathsf{B.}\,n^2+2n-1$$

C.
$$n^2-2n-1$$

D.
$$n^2-2n+1$$

Answer:

10. Straight line joining the points (2,3) and (-1,4) passes through the point (α, β) if

A.
$$lpha+3eta=11$$

- B. $3\alpha + \beta = 11$
- C. lpha+2eta=7
- D. $3\alpha + \beta = 11$

Answer:

11. Let f: $\mathbb{R} \to \mathbb{R}$ be defined by f(x)=1 -|x|. Then

the range of f is

A.
$$(-\infty, -5)$$

B.
$$(-\infty,5)$$

C.
$$(\,-5,\infty)$$

D.
$$(\,-5,\infty)$$

Answer:

12. The expansion of $(1-x)^{-2}$ is?

A.
$$1-x+x^2$$
-,...
B. $1+x+x^2+\ldots$
C. $1-2x+3x^2-\ldots$

D.
$$1 + 2x + 3x^2 +$$

Answer:



13. Which of the following is not a periodic

function with period 2π ?

A. $\tan x$

B. $\cos x$

 $C.\sin x$

D. $\cos ecx$

Answer: A

14. The line $rac{x}{a} - rac{y}{b} = 0$ has the slope 1,if:

A.
$$a = b$$

B. only for a = 1, b = 1

 $\mathsf{C}.\,a>b$

 $\mathsf{D}.\, a < b$

Answer:



15. Which one the following is not true about the matrix [10000005]?

A. an upper triangular matrix

B. a lower triangular matrix

C. a scalar matrix

D. a diagonal matrix

Answer:

16. The unit vector parallel to the resultant of the vectors $\hat{i} + \hat{j} - \hat{k}$ and $\hat{i} - 2\hat{j} + \hat{k}$ is A. $\frac{2\hat{i} - \hat{j} + \hat{k}}{\sqrt{5}}$

B. $rac{2\hat{i}-\hat{j}}{\sqrt{5}}$ C. $rac{\hat{i}-\hat{j}+\hat{k}}{\sqrt{5}}$ D. $rac{2\hat{i}+\hat{j}}{\sqrt{5}}$

Answer:

17. If $f(x) = x^2 - 3x$, then the points at which f(x) = f'(x) are

A. both irrational

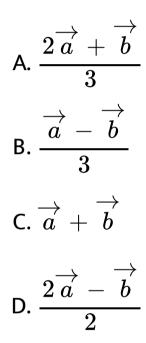
B. one rational and another irrational

C. both positive integers

D. both negative integers

Answer:

18. If \overrightarrow{a} , \overrightarrow{b} are the position vectors A and B then which one of the following points whose position vector lies on AB, is



Answer:



1. Write the use of horizontal line test.

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2. Write the relationship between Permutation

and Combination?

3. Count the number of positive integers greater than 6000 and less than 7000 which are divisible by 5, provided that no digits are repeated?

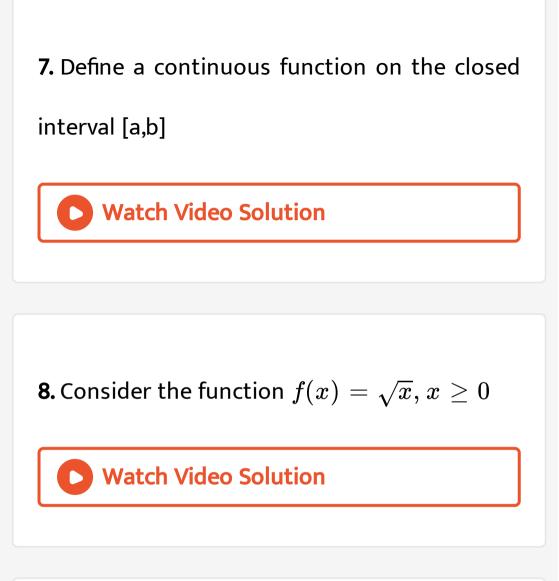


4. Find the separated equations from a combined equation of a straight line $2x^2 + xy - 3y^2 = 0$

5. Define diagonal and scalar matrices?



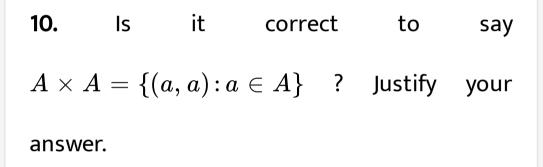
6. Find a unit vector along the directions of the vector $5\hat{i} - 3\hat{j} + 4\hat{k}$?



9. An integer is chosen at random from the first ten positive integers.Find the probability

that it is a multiple of three?







1. A foot ball player can kick a football from ground level with an initial velocity of 80 ft/ second. Find the maximum horizontal distance the football travels and at what angle (Take g=32).

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2. Find the coefficient of x^3 in the expansion of

$$(2-3x)^7$$
?

3. Find the nearest point on the line x - 2y- 5 from the origin.

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4. Prove that square matrix can be expressed as the sum of a symmetric matrix and a skew-

symmetric matrix.

5. If \overrightarrow{a} , \overrightarrow{b} , \overrightarrow{c} are three vectors such that $\overrightarrow{a} + 2\overrightarrow{b} + \overrightarrow{c} = \overrightarrow{0}$ and $\left|\overrightarrow{a}\right| = 3$, $\left|\overrightarrow{b}\right| = 4$, $\left|\overrightarrow{c}\right| = 7$, find the angle between \overrightarrow{a} and \overrightarrow{b} .



6. Examine the continuity of the following :

 $\cot x + \tan x$



7. Differentiate the following :

$$y=\sin^{-1}igg(rac{1-x^2}{1+x^2}igg)$$

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8. Find
$$\frac{dy}{dx}$$
 if x =a (t-sint),y=a(1-cos t)?

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9. Evaluate:
$$\int (x-3)\sqrt{x+2}dx$$
.

10. Construct a suitable domain X such that $f\colon X o N$ defined by f(n)=n+3 to be one to one or onto?

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Part Iv

1. Write any five different forms of an equation

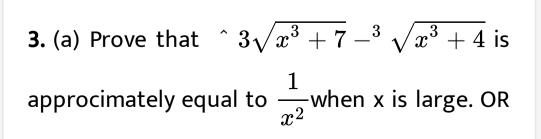
of a straight line.



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2. (a) Solve the equation
$$\sqrt{6-4x-x^2}=x+4$$
 OR (b) Prove that in any $\Delta ABC, \Delta=\sqrt{rac{(s-a)(s-b)}{s(s-c)}}$, where s

is the semi - perimeter of ΔABC ?



(b) Find the unit vectors perpendicular to each of the vector $\overrightarrow{a} + \overrightarrow{b}$ and $\overrightarrow{a} - \overrightarrow{b}$, where $\overrightarrow{a} = \hat{i} + \hat{j} + \hat{k}$ and $\overrightarrow{b} = \hat{i} + 2\hat{j} + 3\hat{k}$?

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4. The chance X, Y and Z becoming managers of certain company and 4:2:3. the probabilities that bonus scheme will be introduced if X,Y and Z become managers are 0.3, 0.5 and 0.4 respectively? If the bonus scheme has been

introduced, What is the probability that Z was

appointed as the manager?

