

MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER-07 (UNSOLVED)



1. Let R be the set of all real numbers. Consider the following subsets of

the

plane

 $R imes R \colon S = \{(x,y) \colon y = x+1 \, ext{ and } \, 0 < x < 2 \} \, ext{ and } \, T = \{(x,y) \colon x-y \}$

is an integer}

Then which of the following is true?

A. T is an equivalence relation but S is not an equivalence relation.

B. Neither S nor T is an equivalence relation

C. Both S and T are equivalence relation

D. S is an equivalence relation but T is not an equivalence relation.

Answer:

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2. If the set A has m elements the set B has n elements and the number

of elements in A imes B is

A. m+n

B. mn

C.
$$\frac{m}{n}$$

 $\mathsf{D}.\,m^2$

Answer:

3. If $rac{ax}{(x+2)(2x-3)}$	$=rac{2}{x+2}+rac{3}{2x-3}$ than a=
A. 8	
B. 7	
C. 5	
D. 4	

Answer:

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4. The number of solutions of $x^2 + |x-1|$ = 1 is

A. 1 B. 0

C. 2

D. 3

Answer:

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5. If $a, 8, b$ are in A.P. , $a, 4, b$ are in G.P. and a, x, b are in H.P. then		
x=		
A. 2		
B. 1		
C. 4		
D. 16		
Answer:		
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6. If 10 lines are drawn in a plane such that no two of them are parallel and no three are concurrent, then the total number of points of

intersection are

A. 45

B. 40

C. 10!

 $\mathsf{D.}\,2^{10}$

Answer:

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7. The value of $e^{2\log x} =$

A. 2x

 $\mathsf{B.}\,x^2$

C. \sqrt{x} D. $\frac{x}{2}$

Answer: B



8. The
$$n^{th}$$
 term of the sequence 1, 2, 4, 7, 11, ... is

A.
$$n^3 + 3n^2 + 2n$$

B. $n^3 - 3n^2 + 3n$
C. $\frac{n(n+1)(n+2)}{3}$
D. $\frac{n^2 - n + 2}{2}$

Answer:



9. The last term in the expansion $\left(2+\sqrt{3}
ight)^8$ is

B. 27

C. 9

D. 3

Answer: A

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10. If $\lambda \hat{i} + 2\lambda \hat{j} + 2\lambda \hat{k}$ is a unit vector,then the value of λ is

A.
$$\frac{1}{3}$$

B. $\frac{1}{4}$
C. $\frac{1}{9}$
D. $\frac{1}{2}$

Answer:

11. One of the diagonals of parallelogram ABCD with \overrightarrow{a} and \overrightarrow{b} as adjacent sides is $\overrightarrow{a} + \overrightarrow{b}$. The other diagonal \overrightarrow{BD} is



Answer:



12. If (1,2,4) and (2,-3 $\lambda, -3$) are the initial and terminal points of the

vector $\hat{i}+5\hat{j}-7\hat{k}$, then value of λ is equal to

13. If y = mx + c and f(0) = f'(0) = 1, then f(2) is

D. 4

Answer:

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14. The derivative of
$$\left(x+rac{1}{x}
ight)^2$$
 w.r.to.x is

A.
$$2x-rac{2}{x^3}$$

B. $2x+rac{2}{x^3}$
C. $2\left(x+rac{1}{x}
ight)$

D. 0

Answer: A



15.
$$\int \frac{\sqrt{\tan x}}{\sin 2x} dx$$
 is
A.
$$\sqrt{\tan x} + c$$

B.
$$2\sqrt{\tan x} + c$$

C.
$$\frac{1}{2}\sqrt{\tan x} + c$$

D.
$$\frac{1}{4}\sqrt{\tan x} + c$$

Answer:



16. An urn contains 5 red and 5 black balls. A ball is drawn at random, its colour is noted and is returned to the urn. Moreover, 2 additional balls

of the colour drawn are put in the urn and then a ball is drawn at random. The probability that the second ball drawn is red will be

A.
$$\frac{5}{12}$$

B. $\frac{1}{2}$
C. $\frac{7}{12}$
D. $\frac{1}{4}$

Answer:

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17. It is given that the events A and B are such that $P(A) = \frac{1}{4}$, $P(A/B) = \frac{1}{2}$ and $P(B/A) = \frac{2}{3}$. Then P(B) is A. $\frac{1}{6}$ B. $\frac{1}{3}$ C. $\frac{2}{3}$



4. Find the number of ways of selecting 9 ball from 6 red balls, 5 white

balls and 5 blue balls if each selection consists of 3 balls of each colour.



7. Calculate
$$\lim_{x o -2} (x^3 - 3x + 6)(-x^2 + 15)$$

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8. Find the derivatives of the following functions with respect to corresponding independent variables.

 $y = e^x \sin x$

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9. Integrate the following with respect to x

$$rac{4}{(3+4x)} + (10x+3)^9 - 3\cos ec(2x+3) \mathrm{cot}(2x+3)$$

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10. P(A) = 0.6, P(B) = 0.5 and $P(A \cap B) = 0.2$ find P(A / B)

Part lii

1. A quadratic polynomial has one of its zeros as 1 + $\sqrt{5}$ and it satisfies

p(1) = 2. find the quadratic polynomial.

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2. Prove that
$$an^{-1}igg(rac{1}{7}igg)+ an^{-1}igg(rac{1}{13}igg)= an^{=-1}igg(rac{2}{9}igg)$$

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3. Find the equation of the line passing through the point (5,2) and perpendiular to the line joining the points (2,3) and (3,-1).

4. Find the area of the triangle whose vertices are (0,0), (1,2) and (4,3).



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

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6. Evaluate:
$$\lim_{x o 0} rac{3^x-1}{\sqrt{1+x}-1}$$

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7. Find the derivatives of the following :

$$an^{-1}igg(rac{\cos x + \sin x}{\cos x - \sin x}igg)$$



3. If the letters of the word GARDEN are permuted in all possible ways and the strings thus formed are arranged in the dictionary order, then find the ranks of the words

Q GARDEN

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4. Find the derivatives of the following :

$$\sqrt{x^2+y^2}= an^{-1}\Big(rac{y}{x}\Big)$$

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5. Let \overrightarrow{a} , \overrightarrow{b} , \overrightarrow{c} be three vectors such that $\left|\overrightarrow{a}\right| = 3$, $\left|\overrightarrow{b}\right| = 4$, $\left|\overrightarrow{c}\right| = 5$ and each one of them being perpendicular to the sum of the other two, find $\left|\overrightarrow{a} + \overrightarrow{b} + \overrightarrow{c}\right|$.

6. Find all the equations of the straight lines in the family of the lines y=mx-3, for which m and the x - coordinate of the point of intersection of the lines with x-y=6 are integers.



7. Express the matrices as the sum of a symmetric matrix and a skew -

symmetric matrix:

 $\begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}.$