MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER - 12

Part I

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1. $A = \{a, b, p\}, B = \{2, 3\}, C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is

A. 8

B. 20

C. 12

D. 16

Answer:

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2. $f(x) = 2x^2$ and $g(x) = \dfrac{1}{3x}$, then fog is ....

A. $\dfrac{3}{2x^2}$

B. $\dfrac{2}{3x^2}$

C. $\dfrac{2}{9x^2}$

D. $\dfrac{1}{6x^2}$

Answer:

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3. A system of three linear equations in three variables is inconsistent if their planes.

A. intersect only at a point

B. intersect in a line

C. coincides with each other

D. do not intersect

Answer:

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4. For the given matrix $A = \begin{bmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{bmatrix}$ the order of the

matrix A^T is

A. 2×3

B. 3×2

C. 3×4

D. 4×3

Answer:

5. Two poles of heights 6 m and 11 stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops ?

A. 13 m

B. 14 m

C. 15 m

D. 12.8 m

Answer:

6. If slope of the line PQ is $\dfrac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is ....

   A. $\sqrt{3}$

   B. $-\sqrt{3}$

   C. $\dfrac{1}{\sqrt{3}}$

   D. 0

Answer:

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7.   If

$(\sin \alpha + \cos ec\, \alpha\,)^{2} + (\cos \alpha + \sec \alpha\,)^{3} = k + \tan^{2} \alpha + \cot^{2} \alpha$,

then the value of k=___.

   A. 9

B. 7

C. 5

D. 3

Answer:

8. The total surface area of a hemi-sphere is how much times the square of its radius.

A. π

B. 4π

C. 3π

D. 2π

Answer:

9. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is

A. 3.5

B. 3

C. 4.5

D. 2.5

Answer:

10. A purse contains 10 notes of Rs. 2000, 15 notes of Rs. 500, and 25 notes of Rs. 200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs. 200 note ?

A. $\dfrac{1}{5}$

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

C. $\dfrac{2}{3}$

D. $\dfrac{4}{5}$

Answer:

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11. If k + 2 , 4k - 6 , 3k- 2 are the consecutive terms of an A.P then the value of k is ....

A. 2

B. 3

C. 4

D. 5

Answer:

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12. The G.C.D. of $x^3 + 1$ and $x^4 - 1$ is ....

A. $x^3 - 1$

B. $x^3 + 1$

C. $x + 1$

D. x - 1

Answer:

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13. The value of k if the straight lines 3x + 6y + 7 = 0 and 2x + ky = 5 are perpendicular is ....

A. 1

B. -1

C. 2

D. $\dfrac{1}{2}$

Answer:

14. Curved surface area of a solid sphere is 48 cm^2. If the sphere is divided into two hemispheres then the total surface area of one of the hemisphere is ....

A. $24cm^2$

B. $8cm^2$

C. $32cm^2$

D. $36cm^2$

Answer:

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1. If $A = \{5, 6\}, B = \{4, 5, 6\}, C = \{5, 6, 7\},$ Show that $A \times A = (B \times B) \cap (C \times C)$

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2. Find the value of k, such that f o g = g o f. If f (x) = 3x + 2, g(x) = 6x - k

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3. Find th largest number which divides 1230 and 1926 leaving remainder 12 in each case.

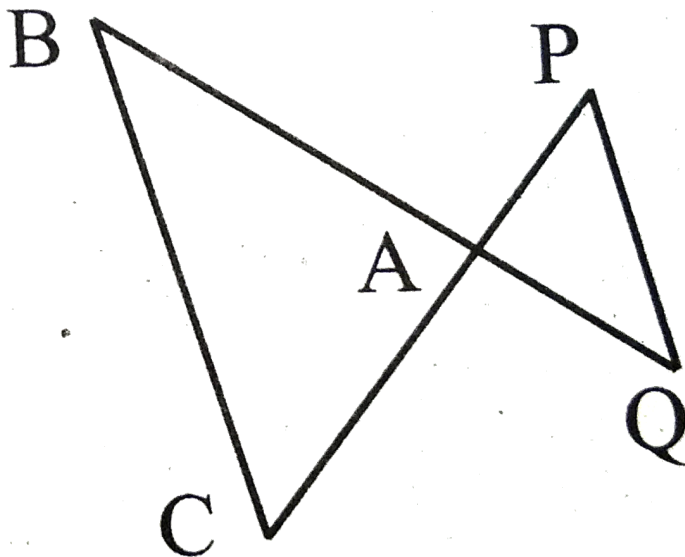**4.** If $1^3 + 2^3 + 3^3 + \ldots + k^3$ = 44100 then find $1 + 2 + 3 + \ldots + k$

5. If a polynomial $p(x) = x^2 - 5x - 14$ is divided by another polynomial q(x) we get $\dfrac{x-7}{x+2}$, find q(x).

6. A has 'a' rows and 'a+3' columns. B has 'b' rows and '17-b' columns, and if both products AB and BA exists, find a, b?

7. In the adjacent figure, $\triangle ACB \sim \triangle APQ$. If BC=8 cm , PQ=4 cm, BA=6.5 cm and AP=2.8 cm, find CA and AQ.

8. Find the intercept made by the following lines on the coordinate axes.

3x-2y-6=0`

9. Prove the identitie $\dfrac{\cos\theta}{1+\sin\theta} = \sec\theta - \tan\theta$

10. A garden roller whose length is 3 m long and whose diameter is 2.8 m is rolled to level a garden. How much area will it cover in 8 revolutions?

11. A bag contains 6 green balls, some black and red balls. Number of black balls is as twice as the number of red balls. Probability of getting a green ball is thrice the probability of getting a red ball. Find (i) number of black balls (ii) total number of balls.

12. Two unbiased dice are rolled once. Find the probaility of getting.

(i) a doublet (equal numbers on both dice)

(ii) the product as a prime number

(iii) the sum as a prime number

(iv) the sum as 1

13. If the sum of first "n" even natural numbers is 420, find the value of n.

14. If (x, y) is any point on the line joining the points A(a, 0) and B (0, b), then show that $\dfrac{x}{a} + \dfrac{y}{b} = 1$

Part Iii

1. Let A= The set of all natural numbers less than 8, B=The set of all prime numbers less than 8, C= The set of even prime number. Verify that

$$(A \cap B) \times C = (A \times C) \cap (B \times C)$$

2. Sivamani is attending an interview for a job and the company gave two offers to him Offer A: ₹20,000 to start with followed by a guaranted annual increase of 6% for the first 5 years.

Offer B: ₹22,000 to start with followed by a guaranteed annual increase of 3% for the first 5 years.

what is this salary in the 4th year with respect to the Offer A and B?

3. In an interschool atheletic meet , with 24 individual events , securing a total of 56 points , a first place secures 5 points , a second place secures 3 points , and a third place secures 1 point. Having a many third place finishers as first and second place finishers , find how many athletes finished in each place .

4. If $A = \dfrac{x}{x+1}, B = \dfrac{1}{x+1}, prove\hat{} ((A+B)^{\wedge}(2)+(A-B)^{\wedge}(2))/(A÷B)=$ $(2(x^{\wedge}(2)+1))/(x(x+1)^{\wedge}(2))`$

5. If $\dfrac{1}{x^4} - \dfrac{6}{x^3} + \dfrac{13}{x^2} + \dfrac{m}{x} + n$ is a perfect square, find the values of m and n.

6. State and prove Thales theorem

Statement

A straight line drawn parallel to a side of triangle intersecting the other two sides , divides the sides in the same ratio.

7. An aeroplane at an altitude of 1800m finds that two boats are selling towards it in the same direction. The angles of depressionn of the boats as obversed from the aeroplane are $60°$ and $30°$ respectively. Find the distance between the two boats. $\left(\sqrt{3} = 1.732\right)$

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8. A metallic sheet in the form of a sector of a circle of radius 21 cm has central angle of $216°$. The sector is made into a cone by bringing the bounding radii together. Find the volume of the cone formed.

9. Marks of the students in a particular subject of a class are given below.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Number of students	8	12	17	14	9	7	4

Find its standard deviation.

10. If $f : R \to R$ is defined by f (x) = ax - 5 and g : $R \to R$ is defined by

g(x) = 5x - 4 find "a" that fog = gof

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11. If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $I - \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ show that

$A^2 - (a + d)A = (bc - ad)I_2$.

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12. Two dice are rolled simultaneously. Find the probability that the

sum of the numbers on the faces is neither divisible by 3 nor by 4.

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Part Iv

1. Draw $\triangle PQR$ such that PQ=6.8 cm, vertical angle is $50°$ and the bisector of the vertical angle meets the base at D where PD=5.2 cm.

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2. Take a point which is 11 cm away from the centre of a circle of radius 4 cm and draw the two tangents to the circle from that point.

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