



MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER 7 (UNSOLVED)

Part I

1. If $A = \{1, 2\}$, $B = \{1, 2, 3, 4\}$, $C = \{5, 6\}$ and $D = \{5, 6, 7, 8\}$ then state which of the following statement is true.

A. $(A \times C) \subset (B \times D)$

B. $(B \times D) \subset (A \times C)$

C. $(A \times B) \subset (A \times D)$

D. $(D \times A) \subset (B \times A)$

Answer:



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2. If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$. Then fog is

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

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

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

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

Answer:



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3. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$

then F_5 is

A. 3

B. 5

C. 8

D. 11

Answer:



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4. The value of

$$(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$$

is

A. 14400

B. 14200

C. 14280

D. 14520

Answer:



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5. The solution of the system

$$x + y - 3z = -6, \quad -7y + 7z = 7, \quad 3z = 9 \quad \text{is}$$

.....

A. $x = 1, y = 2, z = 3$

B. $x = -1, y = 2, z = 3$

C. $x = -1, y = -2, z = 3$

D. $x = 1, y = 2, z = 3$

Answer:



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6. If number of columns and rows are not equal in a matrix then it is said to be a

- A. diagonal matrix
- B. rectangular matrix
- C. square matrix
- D. identity matrix

Answer:



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7. The slope of the line which is perpendicular to a line joining the points $(0, 0)$ and $(-8, 8)$ is

A. -1

B. 1

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

D. -8

Answer:



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8. If $\sin \theta + \cos \theta = a$ and $\sec \theta + \csc \theta = b$,

then the value of $b(a^2 - 1)$ is equal to

A. $2a$

B. $3a$

C. 0

D. $2ab$

Answer:



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9. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

A. $4\pi r^2 sq.$ units

B. $6\pi r^2 sq.$ units

C. $3\pi r^2 sq.$ units

D. $8\pi r^2 sq.$ units

Answer:



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10. The standard deviation of a data is 3 . If each value is multiplied by 5 then the new variance is

A. 3

B. 15

C. 5

D. 225

Answer:



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11. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

- A. 5
- B. 10
- C. 15
- D. 20

Answer:



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12. If α and β are the zeroes of the polynomial

$p(x) = 4x^2 + 3x + 7$ then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to

.....

A. $\frac{7}{3}$

B. $-\frac{7}{3}$

C. $\frac{3}{7}$

D. $-\frac{3}{7}$

Answer:



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13. The common ratio of the G.P. a^{m-n} , a^m , a^{m+n} is

A. a^m

B. a^{-m}

C. a^n

D. a^{-n}

Answer:



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14. If the circumference at the base of a right circular cone and the slant height are $120\pi\text{cm}$ and 10 cm respectively, then the curved surface area of the cone is equal to

A. $1200\pi\text{cm}^2$

B. $600\pi\text{cm}^2$

C. $300\pi\text{cm}^2$

D. 600cm^2

Answer:



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1. Let $A = \{1, 2, 3, 4\}$ and $B = N$, Let $f: A \rightarrow B$ be defined by $f(x) = x^3$ then,

Find the range of f .



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2. If $f(x) = 2x - 1$, $g(x) = \frac{x + 1}{2}$, show that $f \circ g = g \circ f = x$.



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3. Find x so that $x + 6$, $x + 12$ and $x + 15$ are consecutive terms of Geometric Progressions.



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4. Find the excluded values, if any of the following expressions

$$\frac{x^2 + 6x + 8}{x^2 + x - 2}$$



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5. Solve $3p^2 + 2\sqrt{5}p - 5 = 0$ by formula method.



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6. Write each of the following expressions in terms of $\alpha + \beta$ and $\alpha\beta$.

$$\frac{\alpha + 3}{\beta} + \frac{\beta + 3}{\alpha}$$



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7. Rhombus PQRS is inscribed in $\triangle ABC$ such that $\angle B$ is one of its angle. P, Q and R lie on AB, AC and BC respectively. If $AB=12$ cm and $BC=6$ cm, find the sides PQ, RB of the rhombus.



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8. Find the equation of a straight line which is parallel to the line $3x - 7y = 12$ and passing through the point (6,4)



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9. Prove that

$$\frac{\tan^2 \theta - 1}{\tan^2 \theta + 1} = 1 - 2 \cos^2 \theta$$



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10. The standard deviation and coefficient of variation of a data are 1.2 and 25.6 respectively.

Find the value of mean.



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11. Three dice are thrown simultaneously . Find the probability of getting the same number.



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12. Which term of the geometric sequence $5, 2, \frac{4}{5}, \frac{8}{25}, \dots$ is $\frac{128}{15625}$?



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Part iii

1. Let: $f: A \rightarrow B$ be a function defined by

$f(x) = \frac{x}{2} - 1$. Where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2,$

$4, 5, 9\}$. Represents f by

set of ordered pairs,



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2. Given $f(x) = x - 1$, $g(x) = 3x + 1$ and $h(x) = x^2$ show that $(f \circ g) \circ h = f \circ (g \circ h)$



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3. The product of three consecutive terms of a Geometric Progression is 343 and their sum is $\frac{91}{3}$. Find the three terms.



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4. Find the sum of all natural numbers between 602 and 902 which are not divisible by 4.

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5. There are 12 pieces of five, ten and twenty rupee currencies whose total value is ₹105. When first 2 sorts are interchanged in their numbers its value will be increased by ₹20. Find the number of currencies in each sort.

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6. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.



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7. ABCD is a trapezium in which $AB \parallel DC$ and P,Q are points on AD and BC respectively, such that $PQ \parallel DC$ if $PD=18$ cm , $BQ= 35$ cm and $QC= 15$ cm, find AD.



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8. Find the equation of the perpendicular bisector of the line joining the point $A(-4, 2)$ and $B(6, -4)$.



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9. From the top of the tower 60 m high the angles of depression of the top and bottom of a vertical lamp post are observed to be 38° and 60° .

respectively. Find the height of the lamp post.

$$(\tan 38^\circ = 0.7813, \sqrt{3} = 1.732)$$



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10. A hemispherical bowl is filled to the brim with juice. The juice is poured into a cylindrical vessel whose radius is 50% more than its height. If the diameter is same for both the bowl and the cylinder then find the percentage of juice that can be transferred from the bowl into the cylindrical vessel.



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11. A box contains cards numbered 3,5,7,9,..35,37. A card is drawn at random from the box. Find the probability that the drawn card have either multiples of 7 or a prime number.



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12. A function $f: [-7, 6) \rightarrow R$ is defined as follows.

$$f(x) = \begin{cases} x^2 + 2x + 1 & -7 \leq x < -5 \\ x + 5 & -5 \leq x \leq 2 \\ x - 1 & 2 < x < 6 \end{cases}$$

Find $2f(-4) + 3f(2)$



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13. The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction.



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14. If for distribution $\sum (x - 7) = 3$, $\sum (x - 7)^2 = 57$ and total number of item is 20.

Find the mean and standard deviation.



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Part IV

1. Draw a circle of radius 6cm . From a point 10cm away its centre, construct the pair of tangents to the circle and measure their lengths. Verify by using Pythagoras Theorem.



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2. Draw the graph of $y = x^2$ and hence solve $x^2 - 4x - 5 = 0$



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3. Draw the graph of $y = x^2 + 3x + 2$ and use it to solve $x^2 + 2x + 1 = 0$.



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