



MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER -20 (UNSOLVED)

Part I

1. Let $n(A) = m$ and $n(B) = n$ that the total number of non-empty relations that can be defined from A to B is

A. m^n

B. n^m

C. $2^{mn} - 1$

D. $2^{mn} - 1$

Answer: B



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2. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P..... .

A. 4551

B. 10091

C. 7881

D. 13531

Answer:



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3. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \dots + 2^0$

which of the following is true?

A. B is 2^{64} more than A

B. A and B are equal

C. B is larger than A by 1

D. A is larger than B by 1

Answer:



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4. $y^2 + \frac{1}{y^2}$ is not equal to



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5. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

A. $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$

B. $16 \left| \frac{y^2}{x^2z^4} \right|$

C. $\frac{16}{5} \left| \frac{y}{xz^2} \right|$

D. $\frac{16}{5} \left| \frac{xz^2}{y} \right|$

Answer:



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6. If in $\triangle ABC$, $DE \parallel BC$. $AB=3.6$ cm, $AC=2.4$ cm and $AD=2.1$ cm then the length of AE is

A. 1.4cm

B. 1.8cm

C. 1.2 cm

D. 1.05 cm

Answer:



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7. When proving that a quadrilateral is a parallelogram by using slopes you must find

- A. The slop of two sides
- B. The slopes of two pair of opposite sides
- C. The length of all sides
- D. Both the length and slopes of two sides

Answer:



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8. If $\sin \theta = \cos \theta$, then $2 \tan^2 \theta + \sin^2 \theta - 1$ is equal to

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

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

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

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

Answer:



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9. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

A. 12 cm

B. 10 cm

C. 13 cm

D. 5 cm

Answer:



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10. Which of the following is incorrect ?

A. $P(A) > 1$

B. $0 \leq P(A) \leq 1$

C. $P(\phi) = 0$

D. $P(A) = P(\bar{A}) = 1$

Answer:



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11. 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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12. The order pairs of $(a - 11, 6)(-5, 3a - b)$ are equal then (a,b) is

A. $(6,-12)$

B. $(-6,-12)$

C. $(6,12)$

D. $(-6,12)$

Answer:



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13. If α and β are the zeros of the polynomials $x^2 - 5x + 6$ then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to

A. $\frac{-5}{6}$

B. $\frac{-6}{5}$

C. $\frac{6}{5}$

D. $\frac{5}{6}$

Answer:



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Part II

1. Explain one - one function with diagram .



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2. Let $A = \{3, 4, 7, 8\}$ and $B = \{1, 7, 10\}$. Which of the following sets are relations from A to B ?

(i) $R_1 = \{(3, 7), (4, 7), (7, 10), (8, 1)\}$ (i)

$R_2 = \{(3, 1), (4, 12)\}$

(iii)

$R_3 = \{(3, 7), (4, 10), (7, 7), (7, 8), (8, 11), (8, 7), (8, 10)\}$

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3. A man starts his journey from Chennai to Delhi by train . He starts at 22.30 hours on Wednesday . If it takes 32 hours of travelling time and assuming that the train is not late , when will he reach Delhi ?

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4. Find the first term of the G.P. whose common ratio 5 and whose sum to the 6 terms is 46872.

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5. Subtract $\frac{1}{x^2 + 2}$ from $\frac{2x^3 + x^2 + 3}{(x^2 + 2)^2}$



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6. Find the value of 'k' for which the roots of the equation $(5k - 6)x^2 + 2kx + 1 = 0$ are real and equal .



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7. Find the non-zero values of x satisfying the matrix equation

$$x \begin{bmatrix} 2x & 2 \\ 3 & x \end{bmatrix}, 2 \begin{bmatrix} 8 & 5x \\ 4 & 4x \end{bmatrix} = 2 \begin{bmatrix} x^2 + 8 & 24 \\ 10 & 6x \end{bmatrix}$$



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8. The hypotenuse of a right triangle is 6 m more than twice of the shortest side. If the third side is 2 m less than the hypotenuse, find the sides of the triangle ?

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9. Prove that $\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A} = 2 \operatorname{cosec} A$.

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10. Find the slope and y intercept of

$$\sqrt{3}x + (1 - \sqrt{3})y = 3.$$



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11. 4 person live in a conical tent whose slant height is 19 cm. If each person require 22cm^2 of the floor area, then find the height of the tent.



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12. Savita and Hamida are friends . What is the probability that both will have the same birth day ? (ignoring a leap year)



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13. If the coefficient of variation of a collection of data is 57 and its standard deviation is 6.84, then find the mean.



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14. If the m^{th} term of an AP be $\frac{1}{n}$ and n^{th} term $\frac{1}{m}$ be , then show that its $(mn)^{\text{th}}$ term is 1 .



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1. A function is defined by $f(x) = 2x - 3$

Find $\frac{f(0) + f(1)}{2}$.



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2. A mother divides Rs. 207 into three parts such that the amounts are in A.P. and gives it to her three children. The product of the two least amounts that the children had Rs. 4623. Find the amount received by each child.



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3. Find the sum to n terms of the series

$$0.4 + 0.44 + 0.444 + \dots \text{to } n \text{ terms.}$$



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4. In an interschool athletic 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 .



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5. The LCM and GCD of the two polynomials is $(x^2 + y^2)(x^4 + x^2y^2 + y^4)$ and $x^2 - y^2$ one of the polynomials $q(x)$ is $(x^4 - y^4)(x^2 + y^2 - xy)$ find the other polynomials.



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6. If $A = \frac{x}{x+1}$, $B = \frac{1}{x+1}$, prove $\frac{(A+B)^2 + (A-B)^2}{A \div B} = \frac{2(x^2+1)}{(x(x+1))^2}$



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7. 5 m long ladder is placed leaning towards a vertical wall such that it reaches the wall at a point 4 m high. If

the foot of the ladder is moved 1.6 m towards the wall, then find the distance by which the top of the ladder would slide upwards on the wall.

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8. A man is watching a boat speeding away from the top of a tower. The boat makes an angle of depression of 60° with the man's eye when at a distance of 200 m from the tower . After 10 seconds, the angle of depression becomes 45° . What is the approximate speed of the boat (in km/hr) , assuming that it is sailing in still water ? ($\sqrt{3} = 1.732$)

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9. Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tanks will rise by 21 cm.



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10. In a study about viral fever, the number of people affected in a town were noted as

Age in years	0 - 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70
Number of people affected	3	5	16	18	12	7	4

Find its standard deviation.

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11. In a class of 50 students , 28 opted for NCC , 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selecte at random . Find the probability that

- (i) The student opted for NCC but not NSS.
- (ii) The student opted for NSS but not NCC.
- (iii) The student opted for exactly one of them .

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12. If a, b, c, d are in geometric sequence then prove that

$$(b - c)^2 + (c - a)^2 - (d - b)^2 = (a - d)^2$$



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13. If α and β are the roots of the equation

$3x^2 - 4x + 1 = 0$ form a quadratic equation whose

roots are $\frac{\alpha^2}{\beta}$ and $\beta^2\alpha$.



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1. Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.



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2. Draw the graph of $y = (2x - 3)(x + 2)$ and hence solve $(2x - 3)(x + 2) = 0$



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