



MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER 16 (UNSOLVED)

Part I

1. If the ordered pairs $(a + 2, 4)$ and $(5, 2a + b)$ are equal to then (a, b) is

A. $(2, -2)$

B. $(5, 1)$

C. $(2, 3)$

D. $(3, -2)$

Answer:



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2. $7^{4k} = _ _ \pmod{100}$

A. 1

B. 2

C. 3

D. 4

Answer:



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3. An A.P. consists of 31 terms. If its 16th term is m , then the sum of all the terms of this A.P. is

A. 16 m

B. 62m

C. 31m

D. $\frac{31}{2}$ m

Answer:



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

A. $\frac{y^4 + 1}{y^2}$

B. $\left(y + \frac{1}{y}\right)^2$

C. $\left(y - \frac{1}{y}\right)^2 + 1$

D. $\left(y + \frac{1}{y}\right)^2 - 2$

Answer:



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5. If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar,

when

A. $\angle B = \angle E$

B. $\angle A = \angle D$

C. $\angle B = \angle D$

D. $\angle A = \angle D$

Answer:



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6. Consider four straight lines

(i) $l_1 = 3y = 4x + 5$ (ii) $l_2 = 4y = 3x - 1$

(iii) $l_3 = 4y + 3y = 7$ (iv) $l_4 = 4x + 3y = 2$

A. l_1 and l_2 are perpendicular

B. l_1 and l_4 are parallel

C. l_2 and l_4 are perpendicular

D. l_2 and l_3 are parallel

Answer:

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7. If

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

then the value of $k = \underline{\quad}$.

A. 9

B. 7

C. 5

D. 3

Answer:



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8. The height and radius of the cone of which the frustum is a part are h_1 and r_1 respectively. If h_2 and r_2 are the heights and radius of the smaller base of the frustum respectively and $h_2 : h_1 = 1 : 2$, then $r_2 : r_1$ is equal to 1 : 3 (b) 1 : 2 (c) 2 : 1 (d) 3 : 1

A. 1 : 3

B. 1 : 2

C. 2 : 1

D. 3 : 1

Answer:



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9. 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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10. The range of the data 8,8,8,8,8..8 is

A. 0

B. 1

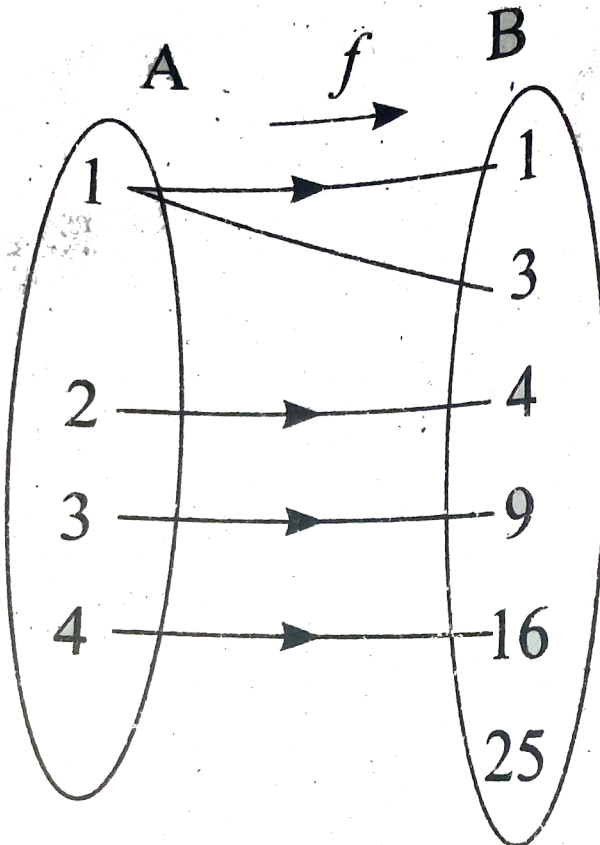
C. 8

D. 3

Answer:

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11. The given diagram represent



- A. an onto function
- B. a constant function
- C. an one-one function
- D. not a function

Answer:

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12. If $a, (a-2)$ and $3a$ are in A.P then the value of a is

- A. -1
- B. 1
- C. -2
- D. 2

Answer:



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13. A cylinder and a cone are of the same base radius and of same height. Find the ratio of the value of the cylinder to that of the cone

A. 1: 3

B. 3: 1

C. 1: 4

D. 2: 3

Answer:



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14. If $(-3 \ 2 \ 1) \begin{pmatrix} 3 \\ -1 \\ x \end{pmatrix} = 8$ then "x" is

A. 15

B. -15

C. 19

D. -19

Answer:

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Part ii

1. The distance S an object travels under the influence of gravity in time t seconds is given by $S(t) = \frac{1}{2}gt^2 + at + b$ where, (g is the acceleration due to gravity), a, b , are constants. Check if the function $S(t)$ is one-one.

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2. If the ordered pairs $(x^2 - 3y, y^2 + 4y)$ and $(-2, 5)$ are equal , then find x and y .

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3. Find the general term for the following sequences

(i) 3,6,9 (ii) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots$

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4. How many terms of the series $1^3 + 2^3 + 3^3 + \dots$ should be taken to get the sum 14400?

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5. Find the G.P. in which the 2nd term is $\sqrt{6}$ and the 6th term is $9\sqrt{6}$?



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6. Simplify

$$\frac{x+2}{x+3} + \frac{x-1}{x-2}$$

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7. Find the values of x , y , and z from the following equations

$$\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$$

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8. In two concentric circles, a chord of length 16 cm of larger circle becomes a tangent to the smaller circle whose radius is 6 cm. Find the radius of the larger circle.

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9. Show that the straight line $x - 2y + 3 = 0$ and $6x + 3y + 8 = 0$ are perpendicular .

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10. A road is flanked on either side by continuous rows of house of height $4\sqrt{3}$ m with no space in between them. A pedestrain is standing on the median of the road facing a row house. The angle of elevationn from the pedestrain to the top of the house is 30° . Find the width of the road.

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11. If A and B are two mutually exclusive events of a random experiment and $P(\text{not } A)=0.45$, $P(A \cup B) = 0.65$, then find $P(B)$.

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12. For what value of k , (-4) is a zero of the polynomial $x^2 - x - (2k + 2)$?

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13. If the mid point of the line segment joining the point $A(3,4)$ and $B(k,6)$ is $P(x,y)$ and $x+y-10=0$, then find the value of k .

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Part iii

1. The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by $t(C)=F$ where

$$F = \frac{9}{5}C + 32.$$

Find $t(0)$

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2. If $f(x) = x - 4$, $g(x) = x^2$ and $h(x) = 3x - 5$, show that the function is associative .

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3. A person saved money every year , half as much as he could in the previous year . If he had totally saved Rs 7875 in 6 years then how much did he save in the first year ?

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4. In a G.P. the 9th term is 32805 and 6th term is 1215. Find the 12th term.

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5. Two woman together took 100 eggs to a market, one had more than the other. Both sold tham for the same sum of the money. The first then said to the second, "If 1 had your eggs, I would have earned ₹15", to which the second replied: "If 1 had your eggs, I would have earned ₹ $6\frac{2}{3}$ ". How many eggs did each had in the beginning?

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6. If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = \frac{-13}{7}$.
find the value of a.

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7. 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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8. Two circles with centres O and O' of radii 3cm and 4 cm, respectively intersect at two points P and Q, such that OP and O'P are tangents to the two circles. Find the length of the common chord PQ.

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9. Find the equation of a straight line through the intersection of lines $3x + 2y = 10$ and $5x - 6y = 2$ and perpendicular to the line $4x - 7y + 13 = 0$.

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10. A TV tower stands vertically on a bank of a canal. The tower is watched from a point on the other bank directly opposite to it. The angle of elevation of the top of the tower is 58° . From another point 20m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30° . Find the height of the tower and the width of the canal. ($\tan 58^\circ = 1.6003$)

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11. The time taken by 50 students to complete a 100 meter race are given below. Find its standard deviation.

Time taken (sec)	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5
Number of students	6	8	17	10	9

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12. In a class 40 % of the students participated in Mathematics-quiz, 30 % in Science-quiz and 10 % in both the quiz programmes. If a student is selected at random from the class, find the probability that the student participated in Mathematics or science or both quiz programmes.

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13. The perimeters of the ends of frustum of a cone are 207.24 cm and 169.56 cm . If the height of the frustum be 8 cm , find the whole surface area of the frustum (use $\pi = 3.14$)

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14. The difference of squares of two numbers is 180. The square of the smaller number is 7 times the larger number , find the two numbers .

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Part Iv

1. Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$.

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