MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER -4

Part I

1. Let f and g be two functions given by

$f = \{(0, 1), (2, 0), (3, -4), (4, 2), (5, 7)\}$

$g(x) = \{(0, 2), (1, 0), (2, 4), (-4, 2), (7, 0)$

then the range of fog is ___.

A. $\{0, 2, 3, 4, 5\}$

B. $\{-4, 1, 0, 2, 7\}$

C. $\{1, 2, 3, 4, 5\}$

D. $\{0, 1, 2\}$

Answer: A::B

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

A. 16m

B. 62m

C. 31m

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

Answer: A::C

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3. The value of $\left(1^3+2^3+3^3+\ldots+15^3\right)-(1+2+3+\ldots+15)$ is .....

A. 14400

B. 14200

C. 14280

D. 14520

Answer: A::B::D

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4. Which of the following should be added to make $x^4 + 64$ a perfect square.

A. $4x^2$

B. $16x^2$

C. $8x^2$

D. $-8x^2$.

Answer: A::B

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5. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is .....

A. 0

B. 1

C. 0 or 1

D. 2

Answer: A

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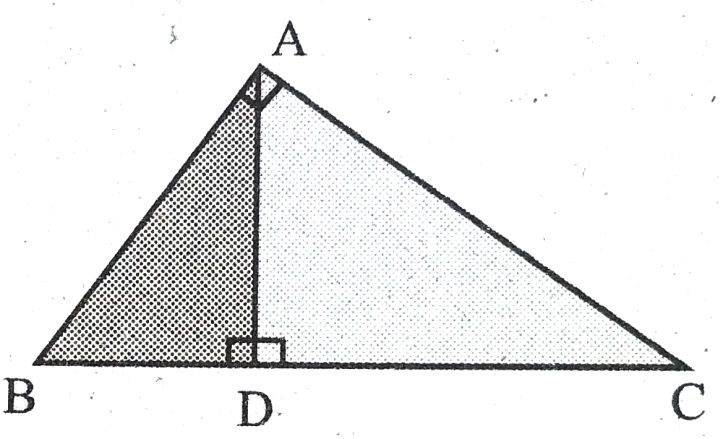
6. In the adjacent figure $\angle BAC = 90^\circ$ and $AD \perp BC$ then



A. $BD.CD = BC^2$

B. $AB.AC = BC^2$

C. $BD.CD = AD^2$

D. $AB.AC = AD^2$

Answer: A::B::C::D

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7. If (5,7),(3,p) and (6,6) are colinear, then the value of p is .....

A. 3

B. 6

C. 9

D. 12

Answer:

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8. $(1+\tan\theta+\sec\theta)(1+\cot\theta-\cos ec\theta)$ is equal to

A. 0

B. 1

C. 2

D. -1

Answer: B

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9. The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is .....

A. $\frac{9\pi h^2}{8}$sq.units

B. $24\pi h^2$sq.units

C. $\frac{8\pi h^2}{9}$sq.units

D. $\frac{56\pi h^2}{9}$sq.units

Answer: B

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10. The mean of 100 observations is 40 and their standard deviation is 3. The sum of all observation is ____.

A. 40000

B. 160900

C. 160000

D. 30000

Answer: A

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11. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

A. $\frac{q}{p+q+r}$

B. $\frac{p}{p+q+r}$

C. $\frac{p+q}{p+q+r}$

D. $\frac{p+r}{p+q+r}$

Answer:

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12. If there are 28 relation from a set $A = \{2, 4, 6, 8\}$ to a set B, then the number of elements in B is .....

A. 7

B. 14

C. 5

D. 4

Answer: A::D

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13. If a_1, a_2, a_3.....are in A.P. such that $\frac{a_4}{a_7} = \frac{3}{2}$, then the 13^{th} term of the AP is .....

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

B. 0

C. $12a_1$

D. $14a_1$

Answer:

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14. The X-intercept of the line $2x - 3y + 5 = 0$ is .....

A. $\frac{5}{2}$

B. $\frac{-5}{2}$

C. $\frac{2}{5}$

D. $\frac{-2}{5}$

Answer: B

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Part Ii

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

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2. If $f(x) = x^2 - 1, g(x) = x - 2$ find a, if gof(a)=1.

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3. Find the number of integer solutions of $3x \equiv 1 \pmod{15}$.

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4. Find the rational form of the number $\overline{0.123}$.

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5. Find the GCD for each pair of the following polynomials

$12\left(x^4-x^3\right), 8\left(x^4-3x^3+2x^2\right)$ whose LCM is $24^3(x-1)(x-2)$

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6. Find the square root of the following polynomials by division method

$x^4 - 12x^3 + 42x^2 - 36x + 9$

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7. 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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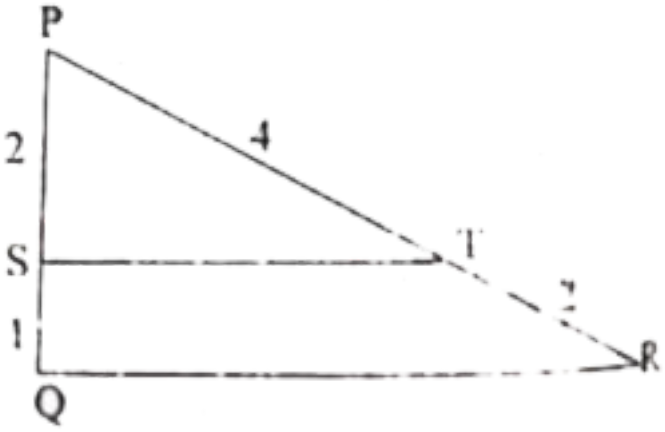
8. In the given diagram show that $\triangle PST \sim \triangle PQR.$



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9. Find the value of "a" for which the given points $(2, 3), (4, a)$ and $(6, -3)$ are collinear.

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10. The horizontal distance between two building is 70m. The angle of depression of the top of the first building when seen from the top of the second building is 45°. If the height of the second building is 120 m, find the height of the first building.

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11. The radius and height of a cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq.

cm. Find its radius and height.

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12. A number is selected at random from integers 1 to 100. Find the probability that it is not a perfect cube.

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13. Find the value of k if $1^3 + 2^3 + 3^3 + \ldots + k^3 = 2025$

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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

$A \times (B - C) = (A \times B) - (AtimeC)$

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2. Consider the function $f(x), g(x), h(x)$ as given below. Show that $(fog)oh = fo(goh)$ in each case.

$f(x) = x - 4, g(x) = x^2$ and $h(x) = 3x - 5$

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3. In an. A.P., sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

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4. If a, b, c are three consecutive terms of an A.P. and x, y, z are three consecutive terms of a G.P. then prove that $x^{b-c} \times y^{c-a} \times z^{a-b} = 1$

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5. There are 12 pieces of five, ten and twenty rupee currrencies 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. Find the square root of the expression $\frac{4x^2}{y^2}+\frac{20x}{y}+13-\frac{30y}{x}+\frac{9y^2}{x^2}-\frac{2x}{y}+5-\frac{3y}{x}$

.

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7. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 5A + 7I_2 = 0$

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8. 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.

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9. Find the value of k, if the area of a quadrilateral is 28 sq.units, whose vertices are $(-4, -2), (-3, k), (3, -2)$ and $(2, 3)$

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10. A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation

of the bird is 45°. The bird flies away horizontallly in such away that it remained at a constant height from the ground. After 2 seconds, the angle

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11. The total marks scored by two students Sathya and Vidhya in 5 subjects are 460 and 480 with standard deviation 4.6 and 2.4 respectively. Who is more consistent in performance ?

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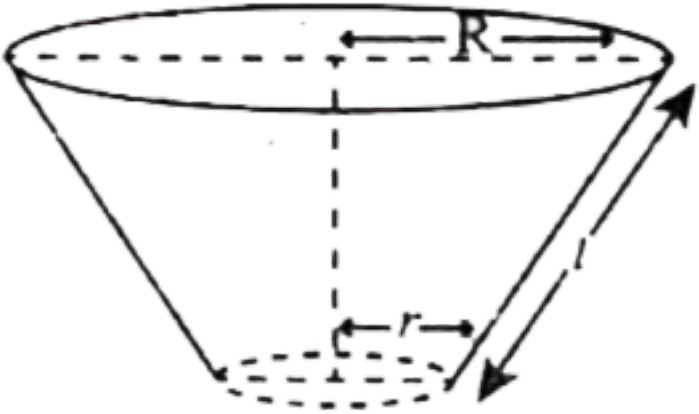
12. The perimeters of the ends of frustum of a cone are 207.24 cm and 169.56cm. If the height of the frustum be 8cm. Find the whole surface area of the frustum. [Use $\pi = 3.14$].



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13. A jar contains 54 marbles each of which is blue, green or white. The probability of selecting a blue marbles at random from the jar is $\frac{1}{3}$ and the probability of selecting a green marble at random is $\frac{4}{9}$. How many white marbles does the jar contain ?

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14. One - fourth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to mountain and the remaining 15 camels

were seen on the bank of a river. Find the total number of camels.

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Part Iv

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

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