MATHS

BOOKS - OSWAAL PUBLICATION

SAMPLE PAPER 8

Exercise

1. Find the 12th term of a G.P. whose 8th term is 192, and the common ratio is 2.

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2. Represent the following set in Roaster form:

$$B = \left\{x : x \text{is an integer}, -\frac{1}{2} < x < \frac{9}{2}\right\}$$

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3. In how many ways can a team of 3 boys and 3 girls be selected from 5 boys and 4 girls ?

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4. If $A = \{x / x \in N \text{ and } x < 4\}$

$B = \left\{x / x^2 - 9 = 0 \text{ and } x < 0\right\}$, find $A \times B$

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5. Given an example of sentence which is not statement.Give reason for the answer.

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6. The angles is a triangle are in the ratio $1:3:5$. Find the magnitude of the greatest angle in radians.

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7. Find the derivative of 99x at x = l00.

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8. Find the multiplicative inverse of $\left(2+\sqrt{3}i\right)^2$.

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9. Find k if the following lines are perpendicular

$(k+2)x+(2k+1)y=7 \text{ and } 5x-4y=23$

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10. Consider the experiment in which a coin is tossed repeatedly until a head comes up. Describe the sample space.

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11. Find the equation of the median through vertex A of ΔABC if

$A = (1, 2), B = (-3, 4), C = (-1, 6)$

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12. Draw appropriate Venn diagram for each of the following :

$(A \cup B)'$

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13. Draw appropriate Venn diagram for each of the following :

$(A \cap B)'$

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14. A coin is tossed twice.What is the probability that atleast one tail occurs?

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15. Write the following relations as the sets of ordered pairs:(i)A relation R from the set {2,3,4,5,6} to the set

{1,2,3} defined by x=2y.

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16. Write the following relations as the sets of ordered pairs:(ii)A realtion R from the set A={5,6,7,8} to the set B={10,12,15,16,18} defined by $(x, y) \in R \Rightarrow$ x divides y

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17. Write the contrapositive and converse of the following statements.

You cannot comprehend geometry if you do not know how to reason deductively.

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18. Find the general solution of $2\cos^2 x + 3\sin x = 0$

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19. Coefficient of variation of distribution are 70 and the standard deviation is 16. What is the arithmetic mean of the distribution

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20. Represent the complex number $\frac{2+6\sqrt{3}i}{5+\sqrt{3}i}$ in polar form.

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21. Evaluate : $\lim_{x \to 2} \frac{x^3 - 3x^2 + 4}{x^4 - 8x^2 + 16}$.

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22. Find all pairs of consecutive odd positive integers,both of which are smaller than 18,such that their sum is more than 20.

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23. Find the co-ordinate of a point equidistant from the four points O(0,0,0),A(a,0,0),B(0,b,0) and C(0,0,c).

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24. If $a \in N$ such that $aN = \{ax : x \in N\}]$.Describe the set $3N \cap 7N$.

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25. Prove that the points (2, -5) & (-2, 4) lie on the same side of the line $3x + y + 5 = 0$.

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26. A horse is tied to a post by arpose.If the horse moves along a circular path always keeping the rope tight and describe 88 meters with it has traced out 72° at the centre,Find the length of the rope.

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27. In a class of 35 students ,24 like to play cricket and 16 like to play football.Also each student like to play at least one of the two games.How many like to play cricket and football both.How many like football only and not cricket.

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28. Let R be the relation over the set $N \times N$ and is defined by $(a, b)R(c, d) \Rightarrow a + d = b + c$. Then R is :

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31. Prove that : $(\cos x - \cos y)^2 + (\sin x - \sin y)^2 = 4\sin^2\left(\frac{x-y}{2}\right)$.

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32. Prove that:

$$x^4 + 4 = (x + 1 + i)(x + 1 - i)(x - 1 + i)(x - 1 - i)$$

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33. How many words with or without meaning can be made from the letter of the word DAUGHTER,assuming that no letter is repeated if (i)4 letters are used at a time.

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34. How many words with or without meaning can be made from the letter of the word DAUGHTER,assuming that no letter is repeated if (ii)All letters are used at a time.

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35. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if.

(i) 4 leters are used at a time,

(ii) all letters are used at a time

(iii) all letters are used but first letter is a vowel ?

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36. If $\frac{z-1}{z+1}$ is purely imaginary, then $|z| =$

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37. Find the term independent of x in the expansion of $\left(3x^2 - \frac{1}{2x^3}\right)^{10}$.

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38. For what value of n, $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ is the arithmetic mean of a and b?

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39. In a class of 100 students 60 drinks tea. 50 drink coffee and 30 drink both .A students from this class is selected at random.Find the probability that the student takes

(i) atleast one of the two drinks

(ii) only one of the two drinks

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41. Find the derivative of function x^n with respect to 'x' from first principle.

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42. Find the co-ordinate of the focus ,equation of the directrix and length of the Latus Rectum of the

Parabola $\left(y^2 = 8x\right)$?

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43. Insert 6 numbers between 3 and 24 so that the resulting sequence is an A.P.

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44. Verify by the method of contradiction that $\sqrt{11}$ is irrational.

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45. 4 persons are selected at random from a group of 3 men , 2 women and 4 children . The probability that exactly two of them are children is :

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47. Defiine a polynimial function.If the function from $f: R \to R$ is defined as $f(x) = x^2$,then draw the

graph of f and find the domain and range.

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48. Prove that by using the principle of mathematical induction for all $n \in N$:

$$1.3 + 2.3^2 + 3.3.^3 + ... + n.3^n = \frac{(2n-1)3^{n+1}+3}{4}$$

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49. A box contains 5 different red and 6 different white balls.In how many ways can 6 balls be selected so that there are atleast 2 balls of each colour?

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50. Using binomial theorem. Prove that 6^n-5n always leaves remainder 1 when divided by 25.

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51. Derive a formula for the angle between two lines with slope m1 and m2.Hence find the acute angle between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

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52. If $A+B+C=\pi$ prove that $\tan\frac{A}{2}\tan\frac{B}{2}+\tan\frac{B}{2}\tan\frac{C}{2}+\tan\frac{C}{2}\tan\frac{A}{2}=1$

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53. Find the sum of 'n' terms of 1.2 +2.3+3.4+4.5+.....

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54. Derive the equation of the ellipse in the form $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1.$

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55. Differentiate the following function with respect to 'x': $\frac{\sin x + \cos x}{\sin x - \cos x}$.

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