MATHS

BOOKS - OSWAAL PUBLICATION

SOLVED PAPER 2020-1

Exercise

1. Given that the number of subsets of a set . A is

16. Find th number of elements in A.

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2. If A={7,8} and B={5,4,2}.Find $A \times B$

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3. Find the modulus and the argument of the complex number $-\sqrt{3}+i$

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4. Write the first five terms of the sequence defined by $a_n = \frac{n}{n+1}$ where n $\in$ N

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5. Find the slope of the line $\frac{x}{3} + \frac{y}{2} = 1$

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6. Write the negation of the statement $\sqrt{2}$ is a complex number.

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7. If $\frac{2}{11}$ is the probability of an event 'A'.What is the probability of the event 'not A'?

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8. If X and Y are two sets such that $X \cup Y$ has 18 elements, X has 8 elements and Y has 15 elements , how many elements does $X \cap Y$ have?

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9. If A={1,2,3},B={3,4} and C={4,5,6},Find $A \times (B \cap C)$

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10. The range of the function $f(x) = \sqrt{9 - x^2}$

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11. Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use $\pi = \frac{22}{7}$)

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12. Prove that $\sin 2x = \dfrac{2\tan x}{1+\tan^2 x}$

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13. Solve each of the following equations.

1. Solve $x^2 + x + 1 = 0$

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14. The marks obtained by a student of class XI in the first and second terminal examination are 62 and 48 respectively. Find the minimum marks he should get in the annual examination to have an average of at least 60 marks .

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15. Find the distance of the point (3,-5) from the line $3x - 4y - 26 = 0$

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16. Find the equation of the line parallel to the line $3x - 4y + 2 = 0$ and passing through the point $(-2, 3)$

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17. Find the co-ordinates of the point P which divides the line segment joining the points A (1, - 2 ,3) and B (3 , 4 - 5) internally in the ratio 2 : 3

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

If x is a prime number, then x is odd.

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19. Write the mean of the given data : 6,7,10,12,13,4,8,12 ?

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20. A letter is chosen at random from the word "ASSASSINATION" . Find the probability that letter is vowel.

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21. A letter is chosen at random from the word 'ASSASSINATION' Find the probability that latter is a vowel (ii) a consonant

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22. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.

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23. Let $f(x) = x^2$ and $g(x) = 2x + 1$be two real valued functions,Find (i)$(f + g)(x)$

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24. Let $f(x) = x^2$ and $g(x) = 2x + 1$be two real valued functions,Find(ii) $(f - g)(x)$

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25. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real values functions, find $(fg)(x)$.

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26. Express the complex number $\left(-1+i\sqrt{3}\right)$ in polar form ?

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27. find general solution $\sin x+\sin 3x+\sin 5x=0$

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28. Find r, if $5^4P_r=6^5P_{r-1}$

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29. Find the middle term in the expansions of $\left(3-\frac{x^3}{6}\right)^7$

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30. Insert five numbers between 8 and 26 such that the resulting sequence is in AP.

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31. The sum of first three terms of a G.P. is $\frac{13}{12}$ and their product is – 1. Find the common ratio and the terms.

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32. Find the centre and radius of the circle $x^2 + y^2 - 4x - 8y - 45 = 0$?

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33. Differentiate of $\sin x$ w.r.t. x from first principles

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34. Verify by the method of contradiction that $\sqrt{7}$ is irrational number

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35. A committee of two persons is selected from two men and two women. What is the

probability that the committee will have (a) no man? (b) one man? (c) two men?

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37. A committee of two persons is selected from two men and two women.What is the probability that the committee will have (c) two men?

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38. If E and F are two events such that $P(E) = \frac{1}{4}, P(E) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$. Find P (not E and not F).

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39. If E and F are two events such that $P(E) = \frac{1}{4}, P(E) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$. Find P (not E and not F).

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40. Define a modulus function . Draw its graph.

Also write down its domain and range.

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41.

$$1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

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42. Prove that

$$\cos^2 + x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$$

and hence find the values of

$$\sin^2 x + \sin^2\left(x + \frac{\pi}{3}\right) + \sin^2\left(x - \frac{\pi}{3}\right)$$

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43. Solve the following system of inequalities graphically

$x + 2y \leq 8, 2x + y \leq 8, x \geq 0, y \geq 0.$

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44. A group consists of 5 girls and 7 boys.In how many ways can a team of 5 members be selected if the team has atleast one boy and one girl.

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45. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected, if the team has.

At least three girls?

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46. State and prove Bionomial theorem for any positive integer n.

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47. Derive the equation of a plane in normal form both in the vector and Cartesian form .

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48. Prove that $\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1.$

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49. Derive the formula to find the co-ordinates of a point which divide the line joining the

points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$internally in the ratio $m : n$.

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50. Find the mean deviation about median for the following data:

Marks Obtained	0-10	10-20	20-30	30-40	40-50	50-60
No. of girls	6	8	14	16	4	2

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51. (a)Derive geometrically that $\cos(x+y) = \cos x \cos y - \sin x \sin y$.Hence deduce the valueof $\cos 75^\circ$

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52. (b) Find the sum to n terms of the series $1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \ldots$

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53. Derive the equation of the ellipse in the form

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$$

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54. (b) Find the derivative of $\frac{x^5 - \cos x}{\sin x}$ with respect to x.

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