



MATHS

BOOKS - OSWAAL PUBLICATION

SOLVED PAPER 2017-1

Exercise

1. Given that the number of subsets of a set A is 16. Find the number of elements in A .



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2. If $(x - 1, y + 3) = (2, x + 4)$ Find the values of x and y .

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3. Convert $\frac{7\pi}{6}$ radians in degree measure ?

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4. Find the multiplicative inverse of $\sqrt{5} + 3i$

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5. Find 20th term of G.P. $\frac{5}{2}, \frac{5}{4}, \frac{5}{8} - - - - -$.

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6. Find 'n' if ${}^m C_9 = {}^n C_8$.

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7. Find the slope of the line $x - y + 3 = 0$

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8. Write the negation of the statement " $\sqrt{7}$ is rational".

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9. Evaluate $\lim_{x \rightarrow 0} \left[\frac{(x + 1)^5 - 1}{x} \right]$.

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

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11. 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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12. If $A = \{-1, 1\}$, find $A \times A \times A$

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13. Let $f(x) = \sqrt{x}$ and $g(x) = x$ find (i) $(f + g) \circ x$ (ii) $(fg) \circ x$

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15. The minute hand of a clock is 2.1cm long. How far does its tip move in 20 minutes. $\left(\text{use } \pi = \frac{22}{7} \right)$

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16. Find the general solutions of $2 \cos^2 x - 3 \sin x = 0$

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17. Evaluate $\lim_{x \rightarrow 1} \frac{x^{15} - 1}{x^{10} - 1}$.

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18. Find the median for the following data.

3,9,5,10,18,4,7,19,21.

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19. Write the converse and contrapositive of 'If a parallelogram is a square, then it is a rhombus'.

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20. On her vacations Veena visits cities A, B, C and D in random order. What is the probability that she visits A before B?

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21. In the triangle ABC with vertices $A(2, 3)$, $B(4, -1)$ and $C(1, 2)$, find the equation and length of altitude from the vertex A.

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22. Find the distance between two parallel lines

$$3x + 4y + 5 = 0 \text{ and } 6x + 8y + 2 = 0$$

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23. Solve $4x + 3 < 6x + 7$.

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24. Show that the points $P(-2, 3, 5)$, $Q(1, 2, 3)$ and $R(7, 0, -1)$ are collinear.

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25. Express $1 + i\sqrt{3}$ in polar form

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26. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?

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27. Define a signum function. Write range, also draw the graph of the function.



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$$28. \tan 4x = \frac{4 \tan x (1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$$

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$$29. \text{ If } x + iy = \sqrt{\frac{a + ib}{c + id}} \text{ Prove that } x^2 + y^2 = \sqrt{\frac{a^2 + b^2}{c^2 + d^2}}$$

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30. Convert the complex number $-\frac{16}{1 + i\sqrt{3}}$ into polar form.

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31. Find $(a + b)^4 - (a - b)^4$. Hence evaluate

$$(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4.$$

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32. 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 letters 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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33. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if.

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

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35. Find the foci and eccentricity of ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$



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36. How many terms of AP - 6 - 11/2, - 5... are needed to give the sum - 25 ?



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37. In an A.P if m^{th} term is n and n^{th} term is m , where $m \neq n$, find the p^{th} term .



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38. Compute the derivative of $\sin x$ using first principal method ?

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39. Verify by the method of contradiction that $\sqrt{2}$ is irrational .

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40. A committee of two persons is selected from two men and two women. What is the probability that the committee will have (i) no men (ii) two men

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41. A committee of two persons is selected from two men and two women. What is the probability that the committee will have (i) no men (ii) two men

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

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43. Prove that $\lim_{x \rightarrow 0} \left(\frac{\sin x}{x} = 1 \right)$?

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44.

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6} \quad \forall n \in \mathbb{N}.$$

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45. Define a modulus function . Draw its graph. Also write down its domain and range.

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46. A group consists of 7 boys and 5 girls . Find the number of ways in which a team of 5 members can be selected so as to have atleast one boy and girl.

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

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48. If p is the length of perpendicular from origin to the line whose intercepts on the axes are 'a' and 'b' then prove

that
$$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2} .$$

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49.
$$\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$$

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50. Solve the following system of inequalities graphically

$$2x + y > -4, x + y \leq 3, 2x - 3y \leq 6,$$

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51. 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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52.

To

$\cos(A + B) = \cos x \cdot \cos y - \sin x \sin y$ and hence find $\cos 75^\circ$

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53. Find the sum to n terms of the series

$$1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \dots$$

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

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