



MATHS

BOOKS - NAVBODH MATHS (HINGLISH)

CHALLENGING QUESTIONS

Questions

1. Find the values of a and b for which the simultaneous equations $x + 2y = 1$ and $(a - b)x + (a + b)y = a + b - 2$ have infinitely many solutions.



Watch Video Solution

2. Draw the graphs representing the equations $2x - y = 2$ and $4x + 3y = 24$ on the same graph paper. Find the area of the triangles formed by these lines, the X-axis and the Y-axis.



[Watch Video Solution](#)

3. Solve the following simultaneous equation:

$$\frac{30}{x - y} + \frac{44}{x + y} = 10, \quad \frac{40}{x - y} + \frac{55}{x + y} = 13.$$



[Watch Video Solution](#)

4. A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the digits get reserved. The sum of the extreme digits is 1 less than the middle digit. Find the number.



[Watch Video Solution](#)

5. A train covered a certain distance at a uniform speed. If the speed of the train would have been 15 km/h more, it would have taken 1.2 hours less than the scheduled time. If the speed of the train would have been 12 km/h less, it would have taken 1.5 hours more than the scheduled time. Find the distance covered by the train.



[Watch Video Solution](#)

6. When the son will be as old as his father today, the sum of their ages then will be 126. When the father was as old as his son is today, the sum of their ages then was 38. Find their present ages.



[Watch Video Solution](#)

7. Solve :
$$\frac{x^{2002} + 10x^{2001}}{10x^{2000}} = 957.9$$



[Watch Video Solution](#)

8. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of

their reciprocals, then prove that $2a^2c = c^2b + b^2a$



[Watch Video Solution](#)

9. A jet plane covers 4500 km in some time. If the regular speed is decreased by 150 km/h, it takes one and a half hours more to complete the journey. Find the original speed of the jet plane.



[Watch Video Solution](#)

10. One tank can be filled up by two taps in 6 hours. The smaller tap alone takes 5 hours more than the bigger tap alone. Find the time required by each tap to fill the tank separately.

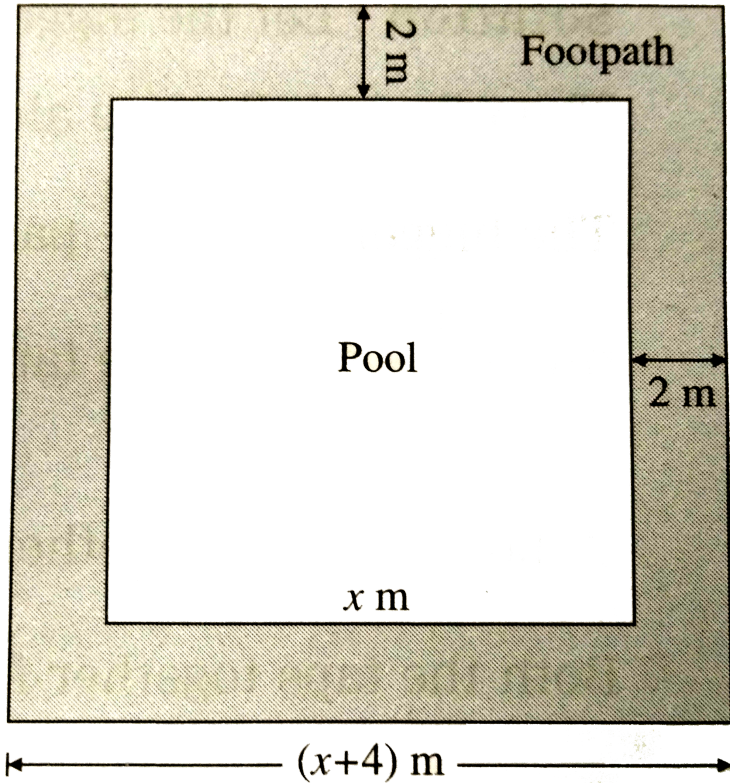


Watch Video Solution

11. Around a square pool, there is a footpath of width $2m$.

If the area of the footpath is $\frac{5}{4}$ times that of the pool,

find the area of the pool.



Watch Video Solution

 Watch Video Solution

12. If the sum of the roots of the quadratic equation

$\frac{1}{x+p} + \frac{1}{x+q} = \frac{1}{r}$ is zero, show that the product of the roots is $\left(-\frac{p^2 + q^2}{2}\right)$

 Watch Video Solution

13. How many terms of the A.P. 16,14,12..... are needed to given the sum 60 ? Explain why do we get two answers.

 Watch Video Solution

14. Find four consecutive terms in an A.P. whose sum is 46 and the product of the 1st and the 3rd is 56. The terms are in ascending order.

 [Watch Video Solution](#)

15. Find the common difference of an AP, whose first term is 100 and the sum of whose first six terms is five times the sum of the next six terms.

 [Watch Video Solution](#)

16. The sum of the third and the seventh terms of an A.P. is 32 and their product is 220. Find the sum of the first

twenty one terms of the A.P. (The terms of the A.P are in ascending order)



[Watch Video Solution](#)

17. How many two-digit numbers leave the remainder 1 when divided by 5? Find the sum of all these numbers.



[View Text Solution](#)

18. Laxmi Electronics sold printer, costing Rs. 8260 (with GST), to a customer for Rs. 10,030 (with GST). The rate of GST is 18%. Find the taxable value of the printer in each case and the amount of CGST and SGST to be paid by Laxmi Electronics.



[Watch Video Solution](#)

19. Shri Patil purchased 140 shares of a company at MV Rs. 1150. FV of the share is Rs. 100. Brokerage is paid at 0.3% and GST on brokerage is 18%. Find (i) the total value of the shares. (ii) the brokerage paid (iii) GST paid on brokerage (iv) total investment for purchasing shares.



[Watch Video Solution](#)

20. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 15, 20, 25, 30, 35, 40, 45, 50 and these are equally likely outcomes. What is the probability that it will point at

(i) an even number? (ii) at a number multiple of 5

(iii) at a number divisible by 3 (iv) at a prime number.

 [Watch Video Solution](#)

21. Six faces of a die are numbered 1,2,2,3,3,6. The die is rolled twice. The total score in two rolls is noted.

Complete the following tabel which gives a few values of the total score on the two rolls. What is the probability that the total score is (i) even (ii) 6 (iii) at least 6?

 [Watch Video Solution](#)

22. Each coefficient in the equation $ax^2 + bx + c = 0$ is obtained by rolling a die. Find the probability that the

equation has equal roots.



Watch Video Solution

23. From the following frequency distribution table, find the values of f_1 and f_2 . The mean of the edats is 166.4 and the sum of the observation is 50. Take assumed mean 165.

Class	140 - 150	150 - 160	160 - 170	170 - 180	180 - 190	190 - 200
Frequency	5	f_1	20	f_2	6	2



Watch Video Solution

24. The following is a frequency distribution of marks:

Marks	20-30	30-40	40-50	50-60	60-70	70-80	Total
Number of students	12	a	30	b	12	10	100

If a and b are equal, find their values. Draw a histogram and a frequency polygon.



Watch Video Solution

25. The following table is based on the marks of the first term examination of 10 th class student. Show the information by a histogram. Also, draw a frequency polygon with the help of the histogram:

Class mark of marks	325	375	425	475	525	575
Number of students	25	35	45	40	32	20

 [Watch Video Solution](#)

Example For Practice

1. Solve:

$$(i) \frac{8}{x+2y} + \frac{3}{2x-y} = 3, \frac{12}{x+2y} - \frac{6}{2x-y} = 1.$$

$$(ii) \frac{2}{x-1} + \frac{3}{y-2} = 1, \frac{5}{x-1} + \frac{6}{y-2} = 7$$

(iii)

$$\frac{1}{3x+y} + \frac{1}{3x-y} = \frac{12}{35}, \frac{1}{2x(3x+y)} - \frac{1}{2(3x-y)} = \frac{2}{35}$$

 [View Text Solution](#)

2. Solve the the simultaneous equations

$$2x + y = 6, \frac{4-3x}{4} = y \text{ graphically.}$$



[Watch Video Solution](#)

3. Anil is older than his friend Baiju by 3 years. Anil's father is thrice as old as Anil. Baiju is twice old as his sister Chitra. The ages of Chitra and Anil's father differ by 49 years. Find the ages of Anil and Baiju.



[Watch Video Solution](#)

4. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the cubes of their reciprocals, then prove that $ab^2 = 3abc + c^3$.



[Watch Video Solution](#)

5. An exterior angle of a regular polygon having n sides is more than that of the polygon having n^2 sides by 50° .

Then find the number of the sides of each polygon



[Watch Video Solution](#)

6. Find the common difference of an A.P. whose first term is 5 and the sum of its first four terms is half the sum of the next four terms.



[Watch Video Solution](#)

7. In April 2018, the number of visitors to Antarctica to see penguins increased daily by 100. If a total of 52500 people

visited Antarctica in that month, how many persons visited Antarctica on 1st April 2018 ?

 [Watch Video Solution](#)

8. Rs. 5000 is deposited at 6% simple interest. Check, if the interest amount at the end of every year is in A.P. then find the amount of interest after 10 years.

 [Watch Video Solution](#)

9. If p th term of an A.P. is $\frac{1}{q}$ and q th term is $\frac{1}{p}$ prove that the sum of the first pq terms is $\frac{1}{2} [pq + 1]$

 [Watch Video Solution](#)

10. Sandeep Electronics purchased ceiling fans for Rs. 50,176 (with GST) and sold them to the customers for Rs. 56,000 (with GST). The rate of GST is 12%. Find the amount of CGST and SGST to be paid by Sandeep Electronics. Also find the taxable value in each case.



[Watch Video Solution](#)

11. Manoj purchased 70 shares at MV Rs. 125. he sold half of the shares at MR Rs. 145 and the remaining shares at MT Rs. 120. He paid brokerage at the rate of 0.2% for each transaction. Find whether he made profit or incurred loss in this transaction. How much?



[Watch Video Solution](#)

12. Two-digit numbers are formed from the digits 0,1,2,3,4 where repetition of the digits are allowed. Find the probability of the events (i) the number is composite (ii) the number is a multiple of 7 (iii) the number is odd.



Watch Video Solution

13. There are 3 boys and 2 girls. A Plant More Trees committee of two is to be formed. Find the probability that the committee contains (i) at the most one girl (ii) at least one boy (iii) only boys.



Watch Video Solution

14. A coin is tossed and a die is rolled simultaneously.

(i) P is the event of getting a head and an odd number.

(ii) Q is the event of getting either H or T and an even number.

(iii) R is the event of getting a prime number on die and a tail.

Find the probability for each event.



[Watch Video Solution](#)

15. The 6th term of an A.P. is zero. Prove that its 21st term is triple its 11th term.



[Watch Video Solution](#)

16. The following table shows the number of patients of different age groups admitted to a hospital for treatment on a day. Find the median age of the patients.

Age group (years)	10–20	20–30	30–40	40–50	50–60	60–70
Number of patients	40	32	35	45	33	15



[Watch Video Solution](#)

17. Among the group of students 10% scored marks below 20, 20% scored marks between 20 and 40, 35% scored marks between 40 and 60, 20% scored marks between 60 and 80 and the remaining 30 students scored marks between 80 and 100.

Prepare frequency distribution table from the above information and draw a histogram.

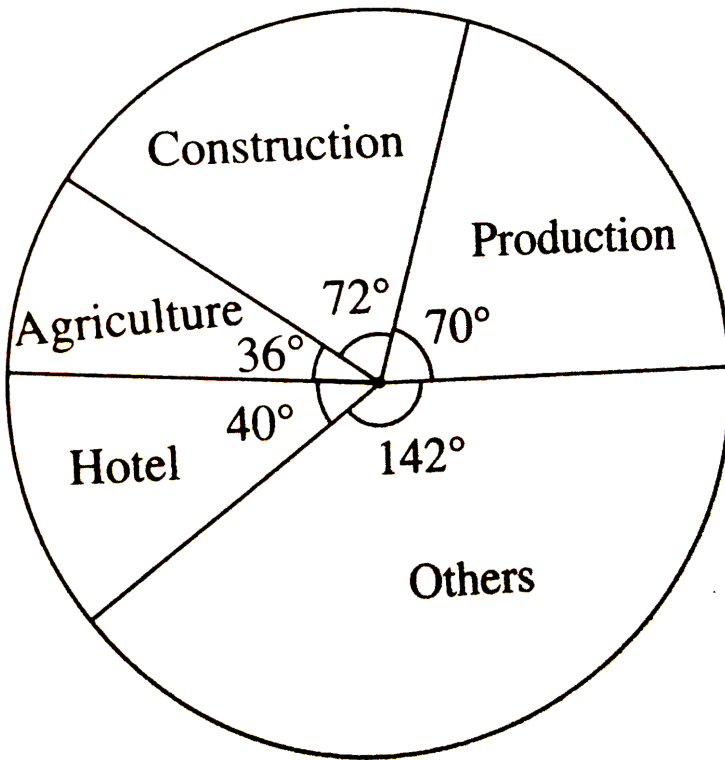


[Watch Video Solution](#)

18. The pie diagram shows the classification of skilled workers.

If the number of workers in construction sector is 3600, answer the following questions:

(i) What is the total number of skilled workers in all fields?



- (ii) What is the number of skilled workers in hotel sector?
- (iii) How many skilled workers are there in production sector?
- (iv) What is the difference between the number of skilled workers in production sector and agriculture sector?

 [Watch Video Solution](#)

19. The median of the following data is 52.5. If the total frequency is 100, find the value of x and y

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	2	5	x	12	17	20	y	9	7	4



[Watch Video Solution](#)

20. The frequency distribution of daily wages of 130 workers is given below. Find the modal wages of a worker.

Daily wages (in ₹)	140-144	145-149	150-154	155-159	160-164	165-169
Number of workers	10	20	25	40	30	5



[Watch Video Solution](#)

21. The following table shows the ages of persons who visited a museum on a certain day. Find the median age of the visitors.

Age (in years)	Number of persons (<i>cf</i> less than)
Less than 10	3
Less than 20	10
Less than 30	22
Less than 40	40
Less than 50	54
Less than 60	71



[Watch Video Solution](#)

22. The following table shows the distribution of weights of seeds. Draw a frequency polygon.

Weights (in mg)	11–20	21–30	31–40	41–50	51–60
Number of seeds	18	22	30	16	4



[Watch Video Solution](#)

