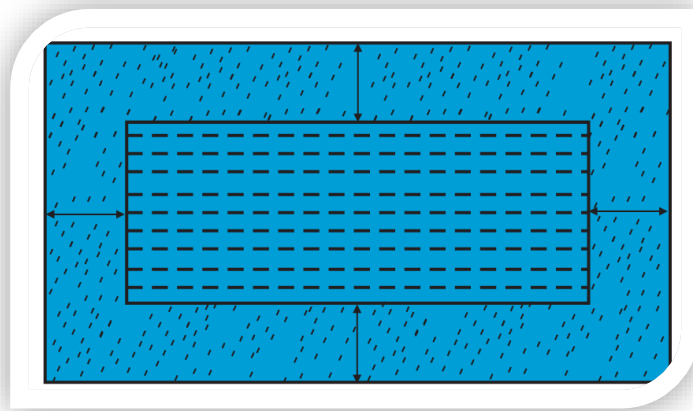




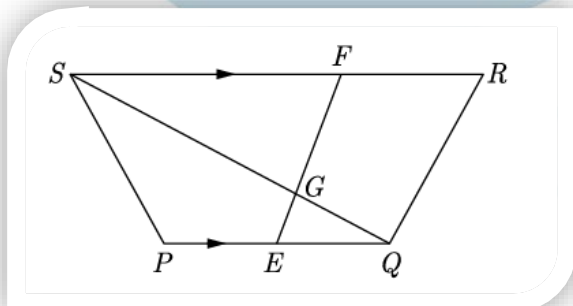
1. The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has
 - (A) two distinct real roots
 - (B) two equal real roots
 - (C) no real roots
 - (D) more than 2 real roots
2. Which of the following equations has two distinct real roots?
 - (A) $2x^2 - 3\sqrt{2}x + \frac{9}{4} = 0$
 - (B) $x^2 + x - 5 = 0$
 - (C) $x^2 + 3x + 2\sqrt{2} = 0$
 - (D) $5x^2 - 3x + 1 = 0$
3. Which of the following equations has no real roots?
 - (A) $x^2 - 4x + 3\sqrt{2} = 0$
 - (B) $x^2 + 4x - 3\sqrt{2} = 0$
 - (C) $x^2 - 4x - 3\sqrt{2} = 0$
 - (D) $3x^2 + 4\sqrt{3}x + 4 = 0$
4. If a pair of linear equations is consistent, then the lines will be
 - (A) parallel
 - (B) always coincident
 - (C) intersecting or coincident
 - (D) always intersecting
5. The pair of equations $y = 0$ and $y = -7$ has
 - (A) one solution
 - (B) two solutions
 - (C) infinitely many solutions
 - (D) no solution
6. The pair of equations $x = a$ and $y = b$ graphically represents lines which are
 - (A) parallel
 - (B) intersecting at (b, a)
 - (C) coincident
 - (D) intersecting at (a, b)
7. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?
 - (A) $\frac{1}{2}$
 - (B) $-\frac{1}{2}$
 - (C) 2
 - (D) -2
8. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is
 - (A) $-\frac{5}{4}$
 - (B) $\frac{2}{5}$
 - (C) $\frac{15}{4}$
 - (D) $\frac{3}{2}$
9. The value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions is
 - (A) 3
 - (B) -3
 - (C) -12
 - (D) no value
10. For what values of a and b does the following pair of linear equations have infinite number of solution?

$$2x + 3y = 7, a(x + y) - b(x - y) = 3a + b - 2$$
11. A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?
12. A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train.

13. In the centre of a rectangular lawn of dimensions $50\text{ m} \times 40\text{ m}$, a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 m^2 [see Fig. 4.1]. Find the length and breadth of the pond.



14. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?
15. If α, β are zeroes of quadratic polynomial $5x^2 + 5x + 1$, find the value of $\alpha^2 + \beta^2$ and $\alpha^{-1} + \beta^{-1}$.
16. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.
17. Solve for x : $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$ $x \neq -1, -2, -4$
18. Solve for x : $4x^2 + 4bx - (a^2 - b^2) = 0$
19. Prove that $\frac{\cot \theta + \operatorname{cosec} \theta - 1}{\cot \theta - \operatorname{cosec} \theta + 1} = \frac{1 + \cot \theta}{\sin \theta}$
20. Prove that $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta} + \frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} = \frac{2}{(\sin^2 \theta - \cos^2 \theta)} = \frac{2}{(2\sin^2 \theta - 1)}$
21. If α and β are zeroes of $x^2 - (k - 6)x + 2(2k - 1)$, find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$.
22. In the figure, $PQRS$ is a trapezium in which $PQ \parallel RS$. On PQ and RS , there are points E and F respectively such that EF intersects SQ at G . Prove that $EQ \times GS = GQ \times FS$.

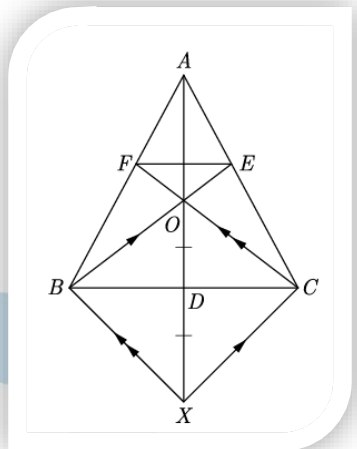


23. In an auditorium, seats are arranged in rows and columns. The number of rows is equal to the number of seats in each row. When the number of rows is doubled and the number of seats in each row is reduced by 10, the total number of seats increases by 300.

- If x is taken as number of rows in original arrangement, write the quadratic equation that describes the situation?
- How many numbers of rows are there in the original arrangement?
- How many numbers of seats are there in the auditorium in original arrangement?
- How many numbers of seats are there in the auditorium after re-arrangement.
- How many numbers of columns are there in the auditorium after re-arrangement?

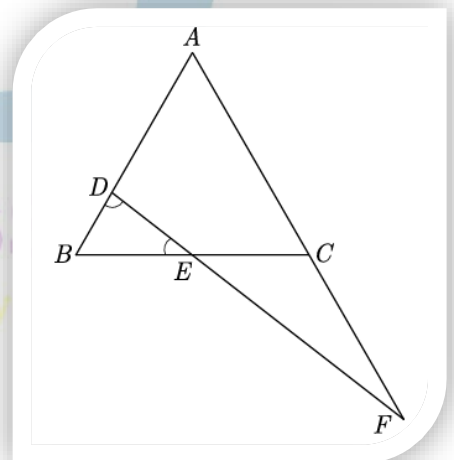


24. There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B. But if 20 students are sent from B to A, the number of students in A becomes double the number of students in B. Find the number of students in the two halls.
25. It can take 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. How long would it take for each pipe to fill the pool separately?
26. Jamila sold a table and a chair for Rs 1050, thereby making a profit of 10% on the table and 25% on the chair. If she had taken a profit of 25% on the table and 10% on the chair she would have got Rs 1065. Find the cost price of each.
27. Nikita travels 14 km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw, and the remaining distance by bus. On the other hand, if she travels 4 km by rickshaw and the remaining distance by bus, she takes 9 minutes longer. Find the speed of the rickshaw and of the bus.
28. A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the station A to B costs Rs 2530. Also, one reserved first class ticket and one reserved first class half ticket from A to B costs Rs 3810. Find the full first class fare from station A to B, and also the reservation charges for a ticket.
29. A shopkeeper sells a saree at 8% profit and a sweater at 10% discount, thereby, getting a sum Rs 1008. If she had sold the saree at 10% profit and the sweater at 8% discount, she would have got Rs 1028. Find the cost price of the saree and the list price (price before discount) of the sweater.
30. A two-digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number.
31. In $\triangle ABC$, AD is a median and O is any point on AD . BO and CO on producing meet AC and AB at E and F respectively. Now AD is produced to X such that $OD = DX$ as shown in figure.



- Prove that:
 (1) $EF \parallel BC$
 (2) $AO:AX = AF:AB$

32. In the figure, $\angle BED = \angle BDE$ and E is the mid-point of BC . Prove that $\frac{AF}{CF} = \frac{AD}{BE}$.



33. If $\sin \theta + \sin^2 \theta = 1$, prove that $\cos^2 \theta + \cos^4 \theta = 1$.