



Octahedral classes, kharadi
2nd floor, yashwant plaza, near bank of India,

Class 10 - Mathematics

Linear equation

Maximum Marks: 40

Time Allowed: 1 hour and 30 minutes

Section A

1. A fraction is such that if the numerator is multiplied by 3 and the denominator is reduced by 3, we get $18/11$, but if the numerator is increased by 8 and the denominator is doubled, we get $2/5$. Find the fraction. 2
2. A part of monthly hostel charges in a college are fixed and the remaining depend on the number of days one has taken food in the mess. When a student A takes food for 20 days, he has to pay Rs.1000 as hostel charges whereas a student B, who takes food for 26 days, pays Rs.1180 as hostel charges. Find the fixed charge and the cost of food per day. 2
3. Father's age is three times the sum of ages of his two children. After 5 years his age will be twice the sum of ages of two children. Find the age of father. 2
4. The area of a rectangle gets reduced by 8 m^2 , when its length is reduced by 5 m and its breadth is increased by 3 m. If we increase the length by 3 m and breadth by 2 m, the area is increased by 74 m^2 . Find the length and the breadth of the rectangle. 2
5. Find the values of a for which the following system of equations has infinitely many solutions: 2
$$2x + 3y - 7 = 0$$
$$(a - 1)x + (a + 1)y = (3a - 1)$$
6. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h, it would have taken 3 hours more than the scheduled time. Find the distance covered by the train. 2
7. Solve: $\frac{5}{x+y} - \frac{2}{x-y} = -1$, $\frac{15}{x+y} + \frac{7}{x-y} = 10$, where $x + y \neq 0$ and $x - y \neq 0$. 2
8. Solve the following system of equations: 2
$$\frac{x}{7} + \frac{y}{3} = 5$$
$$\frac{x}{2} - \frac{y}{9} = 6$$

9. Solve the given pair of equation by reducing them to a pair of linear equations: $\frac{1}{2x} + \frac{1}{3y} = 2$ and $\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$ 3
10. Which of the following pairs of linear equations are consistent/ inconsistent? 3
If consistent, obtain the solution graphically: $2x + y - 6 = 0$; $4x - 2y - 4 = 0$.
11. Solve the following pairs of equations by reducing them to a pair of linear equations: 3
 $\frac{1}{2x} + \frac{1}{3y} = 2$ and $\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$
12. A takes 3 hours more than B to walk a distance of 30 km. but, if a double his pace (speed) he is ahead of B by $1\frac{1}{2}$ hours, find their speed of walking. 3
13. Solve the following pair of linear equations by the elimination method and the substitution method: $x + y = 5$ and $2x - 3y = 4$ 3
14. A motor boat takes 6 hours to cover 100 km downstream and 30 km upstream. 3
If the boat goes 75 km downstream and returns back to the starting point in 8 hours. Find the speed of the boat in still water and the speed of the stream.
15. Solve the following pair of equations graphically: $2x + 3y = 12$, $x - y - 1 = 0$. 3
Shade the region between the two lines represented by the above equations and the X-axis.
16. Solve for x and y, using substitution method: $\frac{3x}{2} - \frac{5y}{3} = -2$, $\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$ 1
17. A part of monthly hostel charges in a school is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 22 days, he has to pay Rs 4250 as hostel charges, whereas a student B, who takes food for 28 days, pays Rs 5150 as hostel charges. Find the fixed charges and the cost of food per day. 1
18. A man purchased 47 stamps of 20 p and 25 p for Rs 10. Find the number of each type of stamps. 1