

PRACTICE QUESTIONS SET – 2 (2024-25)

MATHEMATICS

CLASS – X

Section A

Answer ALL the following Questions. Each question carries 2 marks.

- Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not.
- State whether $(x + 1)(x - 2) + x = 0$ has two distinct real roots. Justify your answer.
- Find the roots of the quadratic equation $\frac{1}{2}x^2 - \sqrt{11}x + 1 = 0$ using quadratic formula.
- If $2x + y = 23$ and $4x - y = 19$, find the value of $(5y - 2x)$ and $\left(\frac{y}{x} - 2\right)$.
- Find the value(s) of k so that pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution.

Section B

Answer ALL the following Questions. Each question carries 3 marks

- For which values of a and b will the pair of linear equations $x + 2y = 1$ and $(a - b)x + (a + b)y = a + b - 2$ has infinitely many solutions?
- Solve for x and y : $\frac{x}{a} + \frac{y}{b} = a + b$, $\frac{x}{a^2} + \frac{y}{b^2} = 2$, $a, b \neq 0$.
- A train, travelling at a uniform speed for 360 km, would have taken 48 min less to travel the same distance, if its speed were 5 km/hr more. Find the original speed of the train.
- Solve for x : $\frac{1}{2x-3} + \frac{1}{x-5} = 1\frac{1}{9}$, $x \neq \frac{3}{2}, 5$
- If the difference of the roots of the equation $x^2 - 7x + 2k = 0$ is 1 then find the value of k .

Section C

Answer ALL the following Questions. Each question carries 5 marks.

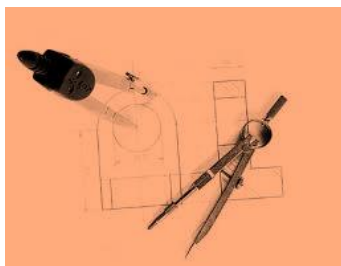
- A motorboat can travel 30 km upstream and 28 km downstream in 7 hours. It can travel 21km upstream and return in 5 hours. Find the speed of boat in still water and

the speed of the train.

12. The sum of two roots of the equation is $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ is zero, then show that product of the two roots is $\left(-\frac{a^2+b^2}{2}\right)$.
13. 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.
- Represent the above problem in the form of the equations in two variables x, y (considering one's place digit x and ten's place digit y , where $y > x$).
 - Hence, solve the equations graphically to find the number.

Section – D: Case Study

14. Quadratic equations are used in many real-life situations such as calculating the areas of an enclosed space, the speed of an object, the profit and loss of a product, or curving a piece of equipment for designing.



- If the roots of the quadratic equation are $2, -3$, find the equation.
- If one root of a quadratic equation is $\frac{1+\sqrt{5}}{7}$, find the other root.
- If one root of the quadratic equation $x^2 + kx + 1 = 0$ is $\left(-\frac{1}{2}\right)$, find k .

OR

If the roots of quadratic equation $x^2 + mx + 12 = 0$ are in the ratio $1 : 3$, find m .

ASSERTION REASON BASED QUESTIONS

A statement of assertion (A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices.

- Both (A) and (R) are true and (R) is the correct explanation of (A).
- Both (A) and (R) are true and (R) is not the correct explanation of (A).
- (A) is true but (R) is false.

(d)(A) is false but (R) is true.

Assertion(A): If $ac \neq 0$, then atleast one of the two equations $ax^2 + bx + c = 0$ and $ax^2 + bx - c = 0$ has real and distinct roots.

Reason(R): A quadratic equation has real and distinct roots if the discriminant is positive.

General Guidelines:

1. You are advised against doing selective study.
2. The questions to be given in the question paper are sample questions for practice prior to Board examination.
3. Although Answer keys will be provided within two/three days of posting of these questions you are advised to answer them yourself.
4. In case you have queries regarding a portion of the chapters being revised here you may send your query to your teacher through Chat section in MS Teams.