Important Concepts and Tips to Solve Quadratic Equations

QUADRATIC EQUATION

- Structure of a quadratic equation = $X^2 \pm$ (Sum of Root) $X \pm$ (Product of root) = 0
- In the question discussed below the coefficient of $X^2 = 1$
- To solve these types of questions, PR (Product of root) will be taken as (PR × coefficient of X^2)
- And X = X value / coefficient of X^2

DIRECTIONS

In each question below one or more equations are given on the basis of which we are supposed to find out the relationship between x and y

Give answer (1) if **X>Y**

Give answer (2) if **X≥Y**

Give answer (3) if **X<Y**

Give answer (4) if **X≤Y**

Give answer (5) if **X=Y** or the relationship **cannot be determined**

QUESTION

(i) $10X^2 - 7X + 1 = 0$

(ii) $35Y^2 - 12Y + 1 = 0$

GIVEN

If the given **SR** is **–ve** then consider it as **+ve**

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In equation (i)

Sum of Root (SR) = +7

Product of Root (PR) = 10 i.e., (1 × 10 = **PR × co-efficient of X^2**)

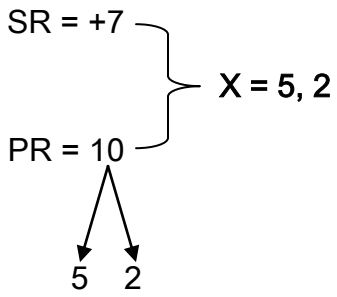
Similarly in eq. (ii)

SR = +12

PR = 35 because (1 × 35 = **PR × co-efficient of Y^2**)

SOLUTION

(i) $10X^2 - 7X + 1 = 0$



Split the PR into its divisible numbers such that when the numbers are added or subtracted we get the SR

Here 5 × 2 = 10 (PR)

And 5 + 2 = 7 (SR)

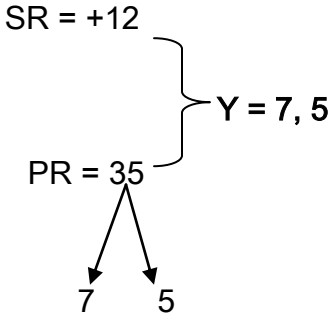
In this type of quadratic equation, where the coefficient of **$X^2 \neq 1$**

X = X value / coefficient of X^2

X = (5, 2) = ([5/10], [2/10]) = (0.5, 0.2)

Therefore, **X = 0.5, 0.2**

(ii) $35Y^2 - 12Y + 1 = 0$



Here 7 × 5 = 35 (PR)

And 7 + 5 = 12 (SR)

Here the coefficient of $Y^2 \neq 1$

Y = Y value / coefficient of Y^2

Y = (7, 5) = ([7/35], [5/35]) = (0.2, 0.14[approx.])

Therefore, **Y = 0.2, 0.14**

We have calculated the values of X and Y, now we have to compare the values with each other to deduce the relation between them

X = 0.5, 0.2; Y = 0.2, 0.14

Take **X = 0.5**, compare it with both the values of Y = 0.2, 0.14

We get, X = 0.5 is greater than Y = 0.2 i.e., **X>Y**

X = 0.5 is greater than Y = 0.14 i.e., **X>Y**

Similarly Take **X = 0.2**, compare it with both the values of Y = 0.2, 0.14

We get, X = 0.2 is equal to Y = 0.2 i.e., **X=Y**

X = 0.2 is greater than Y = 0.14 i.e., **X>Y**

So the relation between X and Y is given by both X = Y and X>Y i.e., **X≥Y**

Therefore **Answer is (2)** if X≥Y