# RD SHARMA

## Solutions

## Class 10 Maths

## Chapter 8

## Ex 8.1

**1. (i) $x^2 - 3x + 2 = 0$ , x = 2 , x = -1**

Here LHS = $x^2$-3x+2

RHS = 0

Now, substitute x = 2 in LHS

We get,

$(2)^2$ -3(2)+2 = 4-6+2 = 6-6 =0 = RHS

Since, LHS =RHS

Therefore, x – 2 is a solution of the given equation.

Similarly, substituting x= -1 in LHS

We get,

$(-1)^2$ -3(-1)+2 = 1+3+2 = 6 ≠ RHS

Since, LHS ≠ RHS = x= -1 is not the solution of the given equation.

**(ii) $x^2$+ x+1 =0 , x= 0 , x= 1**

Here, LHS = $x^2$ +x+1 and RHS =0

Now, substituting x= 0 and x= 1 in LHS

= $0^2$+0+1 = $(1)^2$+1+1 = 1 =3

LHS ≠ RHS

Both x=0 and x=1 are not solutions of the given equation.

**(iii) $x^2-3\sqrt{3}x+6=0$**$x^2 - 3\sqrt{3}x + 6 = 0$ **, $x=\sqrt{3}$ and $x=-2\sqrt{3}$**$x = \sqrt{3}$ and $x = -2\sqrt{3}$

Here,

LHS = $x^2-3\sqrt{3}x+6=0$$x^2 - 3\sqrt{3}x + 6 = 0$ and RHS =0

Substituting the value of $x=\sqrt{3}$ and $x=-2\sqrt{3}$$x = \sqrt{3}$ and $x = -2\sqrt{3}$ in LHS

$\sqrt{3}^2-3\sqrt{3}\times\sqrt{3}+6$$\sqrt{3}^2 - 3\sqrt{3} \times \sqrt{3} + 6$

= 3-9+6

= 0

= RHS

−2√3²−3√3×−2√3+6 $-2\sqrt{3}^2 - 3\sqrt{3} \times -2\sqrt{3} + 6$

= 12+18+6

= 36

≠ RHS

x=√3 $x = \sqrt{3}$ is a solution of the above mentioned equation

Whereas, x=−2√3 $x = -2\sqrt{3}$ is not a solution of the above mentioned equation .

**(iv)** x+1x=136 $x + \frac{1}{x} = \frac{13}{6}$

wherex=56andx=43 where $x = \frac{5}{6}$ and $x = \frac{4}{3}$

Here, LHS = x+1x=136 $x + \frac{1}{x} = \frac{13}{6}$ and RHS = 136 $\frac{13}{6}$

Substituting wherex=56andx=43 where $x = \frac{5}{6}$ and $x = \frac{4}{3}$ in the LHS

= 56+156 $\frac{5}{6} + \frac{1}{\frac{5}{6}}$

= 56+65 $\frac{5}{6} + \frac{6}{5}$

= 25+3630 $\frac{25+36}{30}$

= 6130 $\frac{61}{30}$

≠ RHS

= 43+143 $\frac{4}{3} + \frac{1}{\frac{4}{3}}$

= 43+34 $\frac{4}{3} + \frac{3}{4}$

= 16+912 $\frac{16+9}{12}$

=2512 $\frac{25}{12}$

≠RHS

wherex=56andx=43 where $x = \frac{5}{6}$ and $x = \frac{4}{3}$ are not the solutions of the given equation.

**(v)** $2x^2-x+9 = x^2+4x+3$ , $x = 2$ and $x = 3$

$= 2x^2-x+9 - x^2+4x+3$

$= x^2 -5x+6 = 0$

Here, LHS = $x^2 -5x+6$ and RHS = 0

Substituting x = 2 and x = 3

$= x^2 -5x+6$

$= (2)^2 - 5(2) +6$

=10-10

=0

= RHS

$= x^2 -5x+6$

$= (3)^2 - 5(3) +6$

= 9-15+6

=15-15

=0

= RHS

x = 2 and x = 3 both are the solutions of the given quadratic equation.

**(vi)** $x^2-\sqrt{2}x-4=0$ $x^2 - \sqrt{2}x - 4 = 0$

$x=-\sqrt{2}$ and $x=-2\sqrt{2}$ $x = -\sqrt{2}$ and $x = -2\sqrt{2}$

Here, LHS = $x^2-\sqrt{2}x-4=0$ $x^2 - \sqrt{2}x - 4 = 0$

And RHS = 0

Substituting the value $x=-\sqrt{2}$ and $x=-2\sqrt{2}$ $x = -\sqrt{2}$ and $x = -2\sqrt{2}$ in LHS

= $(-\sqrt{2})^2-\sqrt{2}\times\sqrt{2}-4$ $(-\sqrt{2})^2 - \sqrt{2} \times \sqrt{2} - 4$

= 2 – 2 – 4

= -4

≠RHS

$= (-2\sqrt{2})^2 - \sqrt{2}\times 2\sqrt{2} - 4 (-2\sqrt{2})^2 - \sqrt{2} \times 2\sqrt{2} - 4$

= 8 -4 -4

=8-8

=0

= RHS

$x = -2\sqrt{2}$ $x = -2\sqrt{2}$ is the solution of the above mentioned quadratic equation .

**(vii)** $a^2x^2$-3abx+$2b^2$ = 0

x= ab andx= ba $x = \frac{a}{b}$ and $x = \frac{b}{a}$

Here, LHS = $a^2x^2$ -3abx+$2b^2$ and RHS = 0

Substituting the x= ab andx= ba $x = \frac{a}{b}$ and $x = \frac{b}{a}$ in LHS

= $a^2$( ab )$^2$−3ab( ab )+$2b^2$ $a^2(\frac{a}{b})^2 - 3ab(\frac{a}{b}) + 2b^2$

= $a^4b^2$ −3$a^2$+$2b^2$ $\frac{a^4}{b^2} - 3a^2 + 2b^2$

≠ RHS

= $a^2$( ba )$^2$−3ab( ba )+$2b^2$ $a^2(\frac{b}{a})^2 - 3ab(\frac{b}{a}) + 2b^2$

= $b^2$-3$b^2$ +2$b^2$ = 0 = RHS

x= ba $x = \frac{b}{a}$ is the solution of the above mentioned quadratic equation .

**3.**

**(i)** Given that 23 $\frac{2}{3}$ is a root of the given equation.

The equation is 7$x^2$+kx-3 = 0

According to the question 23 $\frac{2}{3}$ satisfies the equation.

= 7( 23 )$^2$+k( 23 )−3 $7(\frac{2}{3})^2 + k(\frac{2}{3}) - 3$

= 7( 49 )+ 2k3 −3 $7(\frac{4}{9}) + \frac{2k}{3} - 3$

= 2k3=27−289 $\frac{2k}{3} = \frac{27-28}{9}$

= 2k3=−19 $\frac{2k}{3} = \frac{-1}{9}$

= k=−16 $k = \frac{-1}{6}$

**(ii)** Given that x=a is a root of the given equation $x^2$-x(a+b)+k =0

= x=a satisfies the equation

= $a^2$-a(a+b)+k=0

= $a^2 - a^2$-ab+k =0

K = ab

**(iii)** Given that x=√2 $x = \sqrt{2}$ is a root of the given equation kx²+√2x−4 $kx^2 + \sqrt{2}x - 4$

x=√2 $x = \sqrt{2}$ satisfies the given quadratic equation.

=k√2²+√2√2−4 $k\sqrt{2}^2 + \sqrt{2}\sqrt{2} - 4$

=2k+2-4 =0

= 2k-2=0

K = 1

**(iv)** Given that x= -a is the root of the given equation $x^2$+3ax+k = 0

Therefore,

= $(-a)^2$+3a(-a)+k = 0

= $a^2+3a^2$+k =0

= k = $4a^2$= -a satisfies the equation

**(v)** Given that x=√2 $x = \sqrt{2}$ is a root of the given equation kx²+√2x−4 $kx^2 + \sqrt{2}x - 4$

x=√2 $x = \sqrt{2}$ satisfies the given quadratic equation.

=k√2²+√2√2−4 $k\sqrt{2}^2 + \sqrt{2}\sqrt{2} - 4$

$=2k+2-4=0$

$= 2k-2=0$

$K = 1$

**4.** Given to check whether 3 is a root of the equation $\sqrt{x^2-4x+3}+\sqrt{x^2-9}=\sqrt{4x^2-14x+16}$
$\sqrt{x^2-4x+3}+\sqrt{x^2-9}=\sqrt{4x^2-14x+16}$

LHS = $\sqrt{x^2-4x+3}+\sqrt{x^2-9}\sqrt{x^2-4x+3}+\sqrt{x^2-9}$

RHS= $\sqrt{4x^2-14x+16}\sqrt{4x^2-14x+16}$

Substituting x=3 in LHS

$\sqrt{3^2-4\times3+3}\sqrt{3^2-4\times3+3}+\sqrt{3^2-9}\sqrt{3^2-9}$

$\sqrt{9-12+3}\sqrt{9-12+3}+\sqrt{9-9}\sqrt{9-9}$

$\sqrt{12-12}\sqrt{12-12}+\sqrt{9-9}\sqrt{9-9}$

$= 0$

Similarly putting x=3 in RHS

Extra open brace or missing close brac $\sqrt{4(3)^2-14(3)+16}$
$\sqrt{4(3)^2-14(3)+16}$ $\sqrt{52-42}\sqrt{52-42}$ $\sqrt{10}\sqrt{10}$

$\neq$ RHS

X=3 is not the solution the given quadratic equation.