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

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

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

= $(-2\sqrt{2})^2-\sqrt{2}\times2\sqrt{2}-4$ $(-2\sqrt{2})^2 - \sqrt{2} \times 2\sqrt{2} - 4$

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

≠ RHS

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

= b^2-$3b^2$ +$2b^2$ = 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 $7x^2$+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 $x=\sqrt{2}$ $x = \sqrt{2}$ is a root of the given equation $kx^2+\sqrt{2}x-4$ $kx^2 + \sqrt{2}x - 4$

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

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

=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 $x=\sqrt{2}$ $x = \sqrt{2}$ is a root of the given equation $kx^2+\sqrt{2}x-4$ $kx^2 + \sqrt{2}x - 4$

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

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

=2k+2-4 =0

= 2k-2=0

K = 1

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

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

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

Substituting x=3 in LHS

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

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

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

= 0

Similarly putting x=3 in RHS

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

$\sqrt{4(3)^2-14(3)+16}$ $\sqrt{52-42}$ $\sqrt{10}$

≠ RHS

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