

RD SHARMA

Solutions

Class 7 Maths

Chapter 8

Ex 8.1

Q 1. Verify by substitution that :

(i). $x = 4$ is the root of $3x - 5 = 7$

(ii). $x = 3$ is the root of $5 + 3x = 14$

(iii). $x = 2$ is the root of $3x - 2 = 8x - 12$

(iv). $x = 4$ is the root of $3x/2 = 6$

(v). $y = 2$ is the root of $y - 3 = 2y - 5$

(vi). $x = 8$ is the root of $\frac{1}{2}x + 7 = 11$

SOLUTION :

(i). $x = 4$ is the root of $3x - 5 = 7$.

Now, substituting $x = 4$ in place of 'x' in the given equation $3x - 5 = 7$,

$$3(4) - 5 = 7$$

$$12 - 5 = 7$$

$$7 = 7$$

Since, LHS = RHS

Hence, $x = 4$ is the root of $3x - 5 = 7$.

(ii). $x = 3$ is the root of $5 + 3x = 14$.

Now, substituting $x = 3$ in place of 'x' in the given equation $5 + 3x = 14$,

$$5 + 3(3) = 14$$

$$5 + 9 = 14$$

$$14 = 14$$

Since, LHS = RHS

Hence, $x = 3$ is the root of $5 + 3x = 14$.

(iii). $x = 2$ is the root of $3x - 2 = 8x - 12$.

Now, substituting $x = 2$ in place of 'x' in the given equation $3x - 2 = 8x - 12$,

$$3(2) - 2 = 8(2) - 12$$

$$6 - 2 = 16 - 12$$

$$4 = 4$$

Since, LHS = RHS

Hence, $x = 2$ is the root of $3x - 2 = 8x - 12$.

(iv). $x = 4$ is the root of $3x/2 = 6$.

Now, substituting $x = 4$ in place of 'x' in the given equation $3x/2 = 6$,

$$(3 \times 4)/2 = 6$$

$$12/2 = 6$$

$$6 = 6$$

Since, LHS = RHS

Hence, $x = 4$ is the root of $3x/2 = 6$.

(v). $y = 2$ is the root of $y - 3 = 2y - 5$.

Now, substituting $y = 2$ in place of 'y' in the given equation $y - 3 = 2y - 5$,

$$2 - 3 = 2(2) - 5$$

$$-1 = 4 - 5$$

$$-1 = -1$$

Since, LHS = RHS

Hence, $y = 2$ is the root of $y - 3 = 2y - 5$.

(vi). $x = 8$ is the root of $\frac{1}{2}x + 7 = 11$.

Now, substituting $x = 8$ in place of 'x' in the given equation $\frac{1}{2}x + 7 = 11$,

$$\frac{1}{2}(8) + 7 = 11$$

$$4 + 7 = 11$$

$$11 = 11$$

Since, LHS = RHS

Hence, $x = 8$ is the root of $\frac{1}{2}x + 7 = 11$.

Q 2. Solve each of the following equations by trial and error method :

(i). $x + 3 = 12$

(ii). $x - 7 = 10$

(iii). $4x = 28$

(iv). $\frac{x}{2} + 7 = 11$

(v). $2x + 4 = 3x$

(vi). $\frac{x}{4} = 12$

(vii). $\frac{15}{x} = 3$

(viii). $\frac{x}{18} = 20$

SOLUTION :

(i). $x + 3 = 12$

Here, LHS = $x + 3$ and RHS = 12

x	LHS	RHS	Is LHS = RHS
1	$1 + 3 = 4$	12	No
2	$2 + 3 = 5$	12	No
3	$3 + 3 = 6$	12	No
4	$4 + 3 = 7$	12	No
5	$5 + 3 = 8$	12	No
6	$6 + 3 = 9$	12	No
7	$7 + 3 = 10$	12	No
8	$8 + 3 = 11$	12	No
9	$9 + 3 = 12$	12	Yes

Therefore, if $x = 9$, LHS = RHS.

Hence, $x = 9$ is the solution to this equation.

(ii). $x - 7 = 10$

Here, LHS = $x - 7$ and RHS = 10.

x	LHS	RHS	Is LHS = RHS
9	$9 - 7 = 2$	10	No
10	$10 - 7 = 3$	10	No
11	$11 - 7 = 4$	10	No
12	$12 - 7 = 5$	10	No
13	$13 - 7 = 6$	10	No

14	$14 - 7 = 7$	10	No
15	$15 - 7 = 8$	10	No
16	$16 - 7 = 9$	10	No
17	$17 - 7 = 10$	10	Yes

Therefore, if $x = 17$, LHS = RHS.

Hence, $x = 17$ is the solution to this equation.

(iii). $4x = 28$

Here, LHS = $4x$ and RHS = 28.

x	LHS	RHS	Is LHS = RHS
1	$4 \times 1 = 4$	28	No
2	$4 \times 2 = 8$	28	No
3	$4 \times 3 = 12$	28	No
4	$4 \times 4 = 16$	28	No
5	$4 \times 5 = 20$	28	No
6	$4 \times 6 = 24$	28	No
7	$4 \times 7 = 28$	28	Yes

Therefore, if $x = 7$, LHS = RHS

Hence, $x = 7$ is the solution to this equation.

(iv). $\frac{x}{2} + 7 = 11$

Here, LHS = $\frac{x}{2} + 7$ and RHS = 11.

Since RHS is a natural number, $\frac{x}{2}$ must also be a natural number, so we must substitute values of x that are multiples of 2.

x	LHS	RHS	Is LHS = RHS
2	$\frac{2}{2} + 7 = 8$	11	No
4	$\frac{4}{2} + 7 = 9$	11	No
6	$\frac{6}{2} + 7 = 10$	11	No
8	$\frac{8}{2} + 7 = 11$	11	Yes

Therefore, if $x = 8$, LHS = RHS.

Hence, $x = 8$ is the solution to this equation.

(v). $2x + 4 = 3x$

Here, LHS = $2x + 4$ and RHS = $3x$.

x	LHS	RHS	Is LHS = RHS
1	$2(1) + 4 = 6$	$3(1) = 3$	No

2	$2(2) + 4 = 8$	$3(2) = 6$	No
3	$2(3) + 4 = 10$	$3(3) = 9$	No
4	$2(4) + 5 = 12$	$3(4) = 12$	Yes

Therefore, if $x = 4$, LHS = RHS.

Hence, $x = 4$ is the solution to this equation.

(vi). $\frac{x}{4} = 12$

Here, LHS = $\frac{x}{4}$ and RHS = 12.

Since RHS is a natural number, $\frac{x}{4}$ must also be a natural number, so we must substitute values of x that are multiples of 4.

X	LHS	RHS	Is LHS = RHS
16	$\frac{16}{4} = 4$	12	NO
20	$\frac{20}{4} = 5$	12	NO
24	$\frac{24}{4} = 6$	12	NO
28	$\frac{28}{4} = 7$	12	NO
32	$\frac{32}{4} = 8$	12	NO
36	$\frac{36}{4} = 9$	12	NO
40	$\frac{40}{4} = 10$	12	NO
44	$\frac{44}{4} = 11$	12	NO
48	$\frac{48}{4} = 12$	12	Yes

Therefore, if $x = 48$, LHS = RHS.

Hence, $x = 48$ is the solution to this equation.

(vii). $\frac{15}{x} = 3$

Here, LHS = $\frac{15}{x}$ and RHS = 3.

Since RHS is a natural number, $\frac{15}{x}$ must also be a natural number, so we must substitute values of x that are factors of 15.

x	LHS	RHS	Is LHS = RHS
1	$\frac{15}{1} = 15$	3	No
3	$\frac{15}{3} = 5$	3	No
5	$\frac{15}{5} = 3$	3	Yes

Therefore, if $x = 5$, LHS = RHS.

Hence, $x = 5$ is the solution to this equation.

(viii). $\frac{x}{18} = 20$

Here, LHS = $\frac{x}{18}$ and RHS = 20.

Since RHS is a natural number, $\frac{x}{18}$ must also be a natural number, so we must substitute values of x that are multiples of 18.

X	LHS	RHS	Is LHS = RHS
324	$\frac{324}{18}=18$	20	No
342	$\frac{342}{18}=19$	20	No
360	$\frac{360}{18}=20$	20	Yes

Therefore, if $x = 360$, LHS = RHS.

Hence, $x = 360$ is the solution to this equation.