Linear equations in one variable Ex 8.1 Q2

Answer :

(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	$2(4)+4=12$	$3(4)=12$	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.

Linear equations in one variable Ex 8.1 Q5

Answer :

$x2 = 0$

Multiplying both sides by 2, we get

$\Rightarrow x2 \times 2 = 0 \times 2$

$\Rightarrow x = 0$

Verification:

Substituting x= 0 in LHS, we get

LHS =02= 0 and RHS = 0

LHS = 0 and RHS = 0

LHS = RHS

Hence, verified.

********** END **********