EXERCISE 4.1 PAGE: 81

1. Complete the last column of the table.

S. No.	Equation	Value	Say, whether the equation is satisfied. (Yes/No)
(i)	x + 3 = 0	x = 3	
(ii)	x + 3 = 0	x = 0	
(iii)	x + 3 = 0	x = -3	
(iv)	x – 7 = 1	x = 7	
(v)	x – 7 = 1	x = 8	
(vi)	5x = 25	x = 0	
(vii)	5x = 25	x = 5	
(viii)	5x = 25	x = -5	
(ix)	(m/3) = 2	m = - 6	
(x)	(m/3) = 2	m = 0	
(xi)	(m/3) = 2	m = 6	

Solution:-

(i) x + 3 = 0
LHS = x + 3
By substituting the value of x = 3
Then,
LHS = 3 + 3 = 6
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(ii) x + 3 = 0
LHS = x + 3
By substituting the value of x = 0
Then,
LHS = 0 + 3 = 3
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(iii) x + 3 = 0
LHS = x + 3
By substituting the value of x = - 3
Then,
LHS = - 3 + 3 = 0
By comparing LHS and RHS
LHS = RHS
∴Yes, the equation is satisfied

(iv) x - 7 = 1
LHS = x - 7
By substituting the value of x = 7
Then,
LHS = 7 - 7 = 0
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied

(v) x - 7 = 1
LHS = x - 7
By substituting the value of x = 8
Then,
LHS = 8 - 7 = 1
By comparing LHS and RHS
LHS = RHS
∴Yes, the equation is satisfied.

(vi) 5x = 25
LHS = 5x
By substituting the value of x = 0
Then,
LHS = 5 × 0 = 0
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(vii) 5x = 25

LHS = 5x
By substituting the value of x = 5
Then,
LHS = 5 × 5 = 25
By comparing LHS and RHS
LHS = RHS
∴Yes, the equation is satisfied.

(viii) 5x = 25
LHS = 5x
By substituting the value of x = -5
Then,
LHS = 5 × (-5) = - 25
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(ix) m/3 = 2
LHS = m/3
By substituting the value of m = - 6
Then,
LHS = -6/3 = - 2
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(x) m/3 = 2
LHS = m/3
By substituting the value of m = 0
Then,
LHS = 0/3 = 0
By comparing LHS and RHS
LHS ≠ RHS
∴No, the equation is not satisfied.

(xi) m/3 = 2
LHS = m/3

By substituting the value of m = 6
Then,
LHS = 6/3 = 2
By comparing LHS and RHS
LHS = RHS
∴Yes, the equation is satisfied.

S. No.	Equation	Value	Say, whether the equation is satisfied. (Yes/No)
(i)	x + 3 = 0	x = 3	No
(ii)	x + 3 = 0	x = 0	No
(iii)	x + 3 = 0	x = -3	Yes
(iv)	x – 7 = 1	x = 7	No
(v)	x – 7 = 1	x = 8	Yes
(vi)	5x = 25	x = 0	No
(vii)	5x = 25	x = 5	Yes
(viii)	5x = 25	x = -5	No
(ix)	(m/3) = 2	m = - 6	No
(x)	(m/3) = 2	m = 0	No
(xi)	(m/3) = 2	m = 6	Yes

2. Check whether the value given in the brackets is a solution to the given equation or not:
(a) n + 5 = 19 (n = 1)
Solution:-
LHS = n + 5
By substituting the value of n = 1
Then,
LHS = n + 5
= 1 + 5
= 6
By comparing LHS and RHS
6 ≠ 19
LHS ≠ RHS
Hence, the value of n = 1 is not a solution to the given equation n + 5 = 19.

(b) 7n + 5 = 19 (n = – 2)
Solution:-

LHS = 7n + 5
By substituting the value of n = -2
Then,
LHS = 7n + 5
= (7 × (-2)) + 5
= - 14 + 5
= - 9
By comparing LHS and RHS
-9 ≠ 19
LHS ≠ RHS
Hence, the value of n = -2 is not a solution to the given equation 7n + 5 = 19.

(c) 7n + 5 = 19 (n = 2)
Solution:-
LHS = 7n + 5
By substituting the value of n = 2
Then,
LHS = 7n + 5
= (7 × (2)) + 5
= 14 + 5
= 19
By comparing LHS and RHS
19 = 19
LHS = RHS
Hence, the value of n = 2 is a solution to the given equation 7n + 5 = 19.

(d) 4p – 3 = 13 (p = 1)
Solution:-
LHS = 4p - 3
By substituting the value of p = 1
Then,
LHS = 4p - 3
= (4 × 1) - 3
= 4 - 3
= 1
By comparing LHS and RHS
1 ≠ 13

LHS ≠ RHS
Hence, the value of p = 1 is not a solution to the given equation 4p - 3 = 13.

(e) 4p – 3 = 13 (p = – 4)
Solution:-
LHS = 4p - 3
By substituting the value of p = - 4
Then,
LHS = 4p - 3
= (4 × (-4)) - 3
= -16 - 3
= -19
By comparing LHS and RHS
-19 ≠ 13
LHS ≠ RHS
Hence, the value of p = -4 is not a solution to the given equation 4p - 3 = 13.

(f) 4p – 3 = 13 (p = 0)
Solution:-
LHS = 4p - 3
By substituting the value of p = 0
Then,
LHS = 4p - 3
= (4 × 0) - 3
= 0 - 3
= -3
By comparing LHS and RHS
- 3 ≠ 13
LHS ≠ RHS
Hence, the value of p = 0 is not a solution to the given equation 4p - 3 = 13.

3. Solve the following equations by trial and error method:
(i) 5p + 2 = 17
Solution:-
LHS = 5p + 2
By substituting the value of p = 0
Then,

LHS = 5p + 2
= (5 × 0) + 2
= 0 + 2
= 2
By comparing LHS and RHS
2 ≠ 17
LHS ≠ RHS
Hence, the value of p = 0 is not a solution to the given equation.

Let, p = 1
LHS = 5p + 2
= (5 × 1) + 2
= 5 + 2
= 7
By comparing LHS and RHS
7 ≠ 17
LHS ≠ RHS
Hence, the value of p = 1 is not a solution to the given equation.

Let, p = 2
LHS = 5p + 2
= (5 × 2) + 2
= 10 + 2
= 12
By comparing LHS and RHS
12 ≠ 17
LHS ≠ RHS
Hence, the value of p = 2 is not a solution to the given equation.

Let, p = 3
LHS = 5p + 2
= (5 × 3) + 2
= 15 + 2
= 17
By comparing LHS and RHS
17 = 17
LHS = RHS

Hence, the value of p = 3 is a solution to the given equation.

(ii) 3m – 14 = 4

Solution:-

LHS = 3m - 14

By substituting the value of m = 3

Then,

LHS = 3m - 14

= (3 × 3) - 14

= 9 - 14

= - 5

By comparing LHS and RHS

-5 ≠ 4

LHS ≠ RHS

Hence, the value of m = 3 is not a solution to the given equation.

Let, m = 4

LHS = 3m - 14

= (3 × 4) - 14

= 12 - 14

= - 2

By comparing LHS and RHS

-2 ≠ 4

LHS ≠ RHS

Hence, the value of m = 4 is not a solution to the given equation.

Let, m = 5

LHS = 3m - 14

= (3 × 5) - 14

= 15 - 14

= 1

By comparing LHS and RHS

1 ≠ 4

LHS ≠ RHS

Hence, the value of m = 5 is not a solution to the given equation.

Let, m = 6

LHS = 3m - 14
= (3 × 6) - 14
= 18 - 14
= 4
By comparing LHS and RHS
4 = 4
LHS = RHS
Hence, the value of m = 6 is a solution to the given equation.

4. Write equations for the following statements:
(i) The sum of numbers x and 4 is 9.
Solution:-
The above statement can be written in the equation form as,
= x + 4 = 9

(ii) 2 subtracted from y is 8.
Solution:-
The above statement can be written in the equation form as,
= y - 2 = 8

(iii) Ten times a is 70.
Solution:-
The above statement can be written in the equation form as,
= 10a = 70

(iv) The number b divided by 5 gives 6.
Solution:-
The above statement can be written in the equation form as,
= (b/5) = 6

(v) Three-fourth of t is 15.
Solution:-
The above statement can be written in the equation form as,
= ¾t = 15

(vi) Seven times m plus 7 gets you 77.
Solution:-

The above statement can be written in the equation form as,
Seven times m is 7m
= 7m + 7 = 77

(vii) One-fourth of a number x minus 4 gives 4.
Solution:-
The above statement can be written in the equation form as,
One-fourth of a number x is x/4
= x/4 – 4 = 4

(viii) If you take away 6 from 6 times y, you get 60.
Solution:-
The above statement can be written in the equation form as,
6 times of y is 6y
= 6y – 6 = 60

(ix) If you add 3 to one-third of z, you get 30.
Solution:-
The above statement can be written in the equation form as,
One-third of z is z/3
= 3 + z/3 = 30

5. Write the following equations in statement forms:
(i) p + 4 = 15
Solution:-
The sum of numbers p and 4 is 15.

(ii) m – 7 = 3
Solution:-
7 subtracted from m is 3.

(iii) 2m = 7
Solution:-
Twice of number m is 7.

(iv) m/5 = 3
Solution:-

The number m divided by 5 gives 3.

(v) (3m)/5 = 6
Solution:-
Three-fifth of m is 6.

(vi) 3p + 4 = 25
Solution:-
Three times p plus 4 gives you 25.

(vii) 4p – 2 = 18
Solution:-
Four times p minus 2 gives you 18.

(viii) p/2 + 2 = 8
Solution-
If you add half of a number p to 2, you get 8.

6. Set up an equation in the following cases:
(i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. (Take m to be the number of Parmit's marbles.)
Solution:-
From the question it is given that,
Number of Parmit's marbles = m
Then,
Irfan has 7 marbles more than five times the marbles Parmit has
= 5 × Number of Parmit's marbles + 7 = Total number of marbles Irfan having
= (5 × m) + 7 = 37
= 5m + 7 = 37

(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. (Take Laxmi's age to be y years.)
Solution:-
From the question it is given that,
Let Laxmi's age to be = y years old
Then,
Lakshmi's father is 4 years older than three times of her age

= 3 × Laxmi's age + 4 = Age of Lakshmi's father
= (3 × y) + 4 = 49
= 3y + 4 = 49

(iii) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. (Take the lowest score to be l.)

Solution:-

From the question it is given that,
Highest score in the class = 87
Let lowest score be l
= 2 × Lowest score + 7 = Highest score in the class
= (2 × l) + 7 = 87
= 2l + 7 = 87

(iv) In an isosceles triangle, the vertex angle is twice either base angle. (Let the base angle be b in degrees. Remember that the sum of angles of a triangle is 180 degrees).

Solution:-

From the question it is given that,
We know that, the sum of angles of a triangle is 180^o
Let base angle be b
Then,
Vertex angle = 2 × base angle = 2b
= b + b + 2b = 180^o
= 4b = 180^o

EXERCISE 4.2 PAGE: 86

1. Give first the step you will use to separate the variable and then solve the equation:

(a) $x - 1 = 0$

Solution:-

We have to add 1 to both the side of given equation,

Then we get,

$= x - 1 + 1 = 0 + 1$

$= x = 1$

(b) $x + 1 = 0$

Solution:-

We have to subtract 1 to both the side of given equation,

Then we get,

$= x + 1 - 1 = 0 - 1$

$= x = - 1$

(c) $x - 1 = 5$

Solution:-

We have to add 1 to both the side of given equation,

Then we get,

$= x - 1 + 1 = 5 + 1$

$= x = 6$

(d) $x + 6 = 2$

Solution:-

We have to subtract 6 to both the side of given equation,

Then we get,

$= x + 6 - 6 = 2 - 6$

$= x = - 4$

(e) $y - 4 = - 7$

Solution:-

We have to add 4 to both the side of given equation,

Then we get,

$= y - 4 + 4 = - 7 + 4$

$= y = - 3$

(f) $y - 4 = 4$

Solution:-

We have to add 4 to both the side of given equation,

Then we get,

$= y - 4 + 4 = 4 + 4$

$= y = 8$

(g) $y + 4 = 4$

Solution:-

We have to subtract 4 to both the side of given equation,

Then we get,

$= y + 4 - 4 = 4 - 4$

$= y = 0$

(h) $y + 4 = -4$

Solution:-

We have to subtract 4 to both the side of given equation,

Then we get,

$= y + 4 - 4 = -4 - 4$

$= y = -8$

2. Give first the step you will use to separate the variable and then solve the equation:

(a) $3l = 42$

Solution:-

Now we have to divide both sides of the equation by 3,

Then we get,

$= 3l/3 = 42/3$

$= l = 14$

(b) $b/2 = 6$

Solution:-

Now we have to multiply both sides of the equation by 2,

Then we get,

$= b/2 \times 2 = 6 \times 2$

$= b = 12$

(c) $p/7 = 4$

Solution:-

Now we have to multiply both sides of the equation by 7,

Then we get,

= p/7 × 7= 4 × 7

= p = 28

(d) 4x = 25

Solution:-

Now we have to divide both sides of the equation by 4,

Then we get,

= 4x/4 = 25/4

= x = 25/4

(e) 8y = 36

Solution:-

Now we have to divide both sides of the equation by 8,

Then we get,

= 8y/8 = 36/8

= x = 9/4

(f) (z/3) = (5/4)

Solution:-

Now we have to multiply both sides of the equation by 3,

Then we get,

= (z/3) × 3 = (5/4) × 3

= x = 15/4

(g) (a/5) = (7/15)

Solution:-

Now we have to multiply both sides of the equation by 5,

Then we get,

= (a/5) × 5 = (7/15) × 5

= a = 7/3

(g) 20t = - 10

Solution:-

Now we have to divide both sides of the equation by 20,

Then we get,

= 20t/20 = -10/20

= x = - ½

3. Give the steps you will use to separate the variable and then solve the equation:

(a) 3n – 2 = 46

Solution:-

First we have to add 2 to the both sides of the equation,

Then, we get,

= 3n – 2 + 2 = 46 + 2

= 3n = 48

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3n/3 = 48/3

= n = 16

(b) 5m + 7 = 17

Solution:-

First we have to subtract 7 to the both sides of the equation,

Then, we get,

= 5m + 7 - 7 = 17 - 7

= 5m = 10

Now,

We have to divide both sides of the equation by 5,

Then, we get,

= 5m/5 = 10/5

= m = 2

(c) 20p/3 = 40

Solution:-

First we have to multiply both sides of the equation by 3,

Then, we get,

= (20p/3) × 3 = 40 × 3

= 20p = 120

Now,

We have to divide both sides of the equation by 20,

Then, we get,

= 20p/20 = 120/20

= p = 6

(d) 3p/10 = 6

Solution:-

First we have to multiply both sides of the equation by 10,

Then, we get,

= (3p/10) × 10 = 6 × 10

= 3p = 60

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3p/3 = 60/3

= p = 20

4. Solve the following equations:

(a) 10p = 100

Solution:-

Now,

We have to divide both sides of the equation by 10,

Then, we get,

= 10p/10 = 100/10

= p = 10

(b) 10p + 10 = 100

Solution:-

First we have to subtract 10 to the both sides of the equation,

Then, we get,

= 10p + 10 - 10 = 100 - 10

= 10p = 90

Now,

We have to divide both sides of the equation by 10,

Then, we get,

= 10p/10 = 90/10

= p = 9

(c) p/4 = 5

Solution:-

Now,

We have to multiply both sides of the equation by 4,

Then, we get,

= p/4 × 4 = 5 × 4

= p = 20

(d) - p/3 = 5

Solution:-

Now,

We have to multiply both sides of the equation by - 3,

Then, we get,

= - p/3 × (- 3) = 5 × (- 3)

= p = - 15

(e) 3p/4 = 6

Solution:-

First we have to multiply both sides of the equation by 4,

Then, we get,

= (3p/4) × (4) = 6 × 4

= 3p = 24

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3p/3 = 24/3

= p = 8

(f) 3s = - 9

Solution:-

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3s/3 = -9/3

= s = -3

(g) 3s + 12 = 0

Solution:-

First we have to subtract 12 to the both sides of the equation,

Then, we get,

= 3s + 12 - 12 = 0 - 12

= 3s = -12

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3s/3 = -12/3

= s = - 4

(h) 3s = 0

Solution:-

Now,

We have to divide both sides of the equation by 3,

Then, we get,

= 3s/3 = 0/3

= s = 0

(i) 2q = 6

Solution:-

Now,

We have to divide both sides of the equation by 2,

Then, we get,

= 2q/2 = 6/2

= q = 3

(j) 2q - 6 = 0

Solution:-

First we have to add 6 to the both sides of the equation,

Then, we get,

= 2q - 6 + 6 = 0 + 6

= 2q = 6

Now,

We have to divide both sides of the equation by 2,

Then, we get,

= 2q/2 = 6/2

= q = 3

(k) 2q + 6 = 0

Solution:-

First we have to subtract 6 to the both sides of the equation,

Then, we get,

= 2q + 6 - 6 = 0 - 6

= 2q = - 6

Now,

We have to divide both sides of the equation by 2,

Then, we get,

= 2q/2 = - 6/2

= q = - 3

(l) 2q + 6 = 12

Solution:-

First we have to subtract 6 to the both sides of the equation,

Then, we get,

= 2q + 6 - 6 = 12 - 6

= 2q = 6

Now,

We have to divide both sides of the equation by 2,

Then, we get,

= 2q/2 = 6/2

= q = 3

EXERCISE 4.3 PAGE: 89

1. Solve the following equations:

(a) 2y + (5/2) = (37/2)

Solution:-

By transposing (5/2) from LHS to RHS it becomes -5/2

Then,

= 2y = (37/2) – (5/2)

= 2y = (37-5)/2

= 2y = 32/2

Now,

Divide both side by 2,

= 2y/2 = (32/2)/2

= y = (32/2) × (1/2)

= y = 32/4

= y = 8

(b) 5t + 28 = 10

Solution:-

By transposing 28 from LHS to RHS it becomes -28

Then,

= 5t = 10 – 28

= 5t = - 18

Now,

Divide both side by 5,

= 5t/5= -18/5

= t = -18/5

(c) (a/5) + 3 = 2

Solution:-

By transposing 3 from LHS to RHS it becomes -3

Then,

= a/5 = 2 – 3

= a/5 = - 1

Now,

Multiply both side by 5,

= (a/5) × 5= -1 × 5

= a = -5

(d) (q/4) + 7 = 5

Solution:-

By transposing 7 from LHS to RHS it becomes -7

Then,

= q/4 = 5 – 7

= q/4 = - 2

Now,

Multiply both side by 4,

= (q/4) × 4= -2 × 4

= a = -8

(e) (5/2) x = -5

Solution:-

First we have to multiply both the side by 2,

= (5x/2) × 2 = - 5 × 2

= 5x = - 10

Now,

We have to divide both the side by 5,

Then we get,

= 5x/5 = -10/5

= x = -2

(f) (5/2) x = 25/4

Solution:-

First we have to multiply both the side by 2,

= (5x/2) × 2 = (25/4) × 2

= 5x = (25/2)

Now,

We have to divide both the side by 5,

Then we get,

= 5x/5 = (25/2)/5

= x = (25/2) × (1/5)

= x = (5/2)

(g) 7m + (19/2) = 13

Solution:-

By transposing (19/2) from LHS to RHS it becomes -19/2

Then,

= 7m = 13 – (19/2)

= 7m = (26 - 19)/2

= 7m = 7/2

Now,

Divide both side by 7,

= 7m/7 = (7/2)/7

= m = (7/2) × (1/7)

= m = ½

(h) 6z + 10 = - 2

Solution:-

By transposing 10 from LHS to RHS it becomes - 10

Then,

= 6z = -2 – 10

= 6z = - 12

Now,

Divide both side by 6,

= 6z/6 = -12/6

= m = - 2

(i) (3/2) l = 2/3

Solution:-

First we have to multiply both the side by 2,

= (3l/2) × 2 = (2/3) × 2

= 3l = (4/3)

Now,

We have to divide both the side by 3,

Then we get,

= 3l/3 = (4/3)/3

= l = (4/3) × (1/3)

= x = (4/9)

(j) (2b/3) - 5 = 3

Solution:-

By transposing -5 from LHS to RHS it becomes 5
Then,
= 2b/3 = 3 + 5
= 2b/3 = 8
Now,
Multiply both side by 3,
= (2b/3) × 3= 8 × 3
= 2b = 24
And,
Divide both side by 2,
= 2b/2 = 24/2
= b = 12

2. Solve the following equations:
(a) 2(x + 4) = 12
Solution:-
Let us divide both the side by 2,
= (2(x + 4))/2 = 12/2
= x + 4 = 6
By transposing 4 from LHS to RHS it becomes -4
= x = 6 – 4
= x = 2

(b) 3(n – 5) = 21
Solution:-
Let us divide both the side by 3,
= (3(n - 5))/3 = 21/3
= n - 5 = 7
By transposing -5 from LHS to RHS it becomes 5
= n = 7 + 5
= n = 12

(c) 3(n – 5) = – 21
Solution:-
Let us divide both the side by 3,
= (3(n - 5))/3 = - 21/3

= n - 5 = -7

By transposing -5 from LHS to RHS it becomes 5

= n = - 7 + 5

= n = - 2

(d) – 4(2 + x) = 8

Solution:-

Let us divide both the side by -4,

= (-4(2 + x))/ (-4) = 8/ (-4)

= 2 + x = -2

By transposing 2 from LHS to RHS it becomes - 2

= x = -2 - 2

= x = - 4

(e) 4(2 – x) = 8

Solution:-

Let us divide both the side by 4,

= (4(2 - x))/ 4 = 8/ 4

= 2 - x = 2

By transposing 2 from LHS to RHS it becomes - 2

= - x = 2 - 2

= - x = 0

= x = 0

3. Solve the following equations:

(a) 4 = 5(p – 2)

Solution:-

Let us divide both the side by 5,

= 4/5 = (5(p – 2))/5

= 4/5 = p -2

By transposing - 2 from RHS to LHS it becomes 2

= (4/5) + 2 = p

= (4 + 10)/ 5 = p

= p = 14/5

(b) – 4 = 5(p – 2)

Solution:-

Let us divide both the side by 5,

= - 4/5 = (5(p – 2))/5

= - 4/5 = p -2

By transposing - 2 from RHS to LHS it becomes 2

= - (4/5) + 2 = p

= (- 4 + 10)/ 5 = p

= p = 6/5

(c) 16 = 4 + 3(t + 2)

Solution:-

By transposing 4 from RHS to LHS it becomes – 4

= 16 – 4 = 3(t + 2)

= 12 = 3(t + 2)

Let us divide both the side by 3,

= 12/3 = (3(t + 2))/ 3

= 4 = t + 2

By transposing 2 from RHS to LHS it becomes - 2

= 4 – 2 = t

= t = 2

(d) 4 + 5(p – 1) =34

Solution:-

By transposing 4 from LHS to RHS it becomes – 4

= 5(p – 1) = 34 – 4

= 5(p - 1) = 30

Let us divide both the side by 5,

= (5(p - 1))/ 5 = 30/5

= p – 1 = 6

By transposing - 1 from RHS to LHS it becomes 1

= p = 6 + 1

= p = 7

(e) 0 = 16 + 4(m – 6)

Solution:-

By transposing 16 from RHS to LHS it becomes – 16

= 0 – 16 = 4(m - 6)

= - 16 = 4(m - 6)

Let us divide both the side by 4,

= - 16/4 = (4(m - 6))/ 4

= - 4 = m - 6

By transposing - 6 from RHS to LHS it becomes 6

= - 4 + 6 = m

= m = 2

4. (a) Construct 3 equations starting with x = 2

Solution:-

First equation is,

Multiply both side by 6

= 6x = 12 … [equation 1]

Second equation is,

Subtracting 4 from both side,

= 6x – 4 = 12 -4

= 6x – 4 = 8 … [equation 2]

Third equation is,

Divide both side by 6

= (6x/6) – (4/6) = (8/6)

= x – (4/6) = (8/6) … [equation 3]

(b) Construct 3 equations starting with x = – 2

Solution:-

First equation is,

Multiply both side by 5

= 5x = -10 … [equation 1]

Second equation is,

Subtracting 3 from both side,

= 5x – 3 = - 10 – 3

= 5x - 3 = - 13 … [equation 2]

Third equation is,

Dividing both sides by 2

= (5x/2) – (3/2) = (-13/2) … [equation 3]

EXERCISE 4.4 PAGE: 91

1. Set up equations and solve them to find the unknown numbers in the following cases:

(a) Add 4 to eight times a number; you get 60.

Solution:-

Let us assume the required number be x

Eight times a number = 8x

The given above statement can be written in the equation form as,

= 8x + 4 = 60

By transposing 4 from LHS to RHS it becomes – 4

= 8x = 60 – 4

= 8x = 56

Divide both side by 8,

Then we get,

= (8x/8) = 56/8

= x = 7

(b) One-fifth of a number minus 4 gives 3.

Solution:-

Let us assume the required number be x

One-fifth of a number = (1/5) x = x/5

The given above statement can be written in the equation form as,

= (x/5) - 4 = 3

By transposing - 4 from LHS to RHS it becomes 4

= x/5 = 3 + 4

= x/5 = 7

Multiply both side by 5,

Then we get,

= (x/5) × 5 = 7 × 5

= x = 35

(c) If I take three-fourths of a number and add 3 to it, I get 21.

Solution:-

Let us assume the required number be x

Three-fourths of a number = (3/4) x

The given above statement can be written in the equation form as,

= (3/4) x + 3 = 21

By transposing 3 from LHS to RHS it becomes - 3

= (3/4) x = 21 - 3

= (3/4) x = 18

Multiply both side by 4,

Then we get,

= (3x/4) × 4 = 18 × 4

= 3x = 72

Then,

Divide both side by 3,

= (3x/3) = 72/3

= x = 24

(d) When I subtracted 11 from twice a number, the result was 15.

Solution:-

Let us assume the required number be x

Twice a number = 2x

The given above statement can be written in the equation form as,

= 2x –11 = 15

By transposing -11 from LHS to RHS it becomes 11

= 2x = 15 + 11

= 2x = 26

Then,

Divide both side by 2,

= (2x/2) = 26/2

= x = 13

(e) Munna subtracts thrice the number of notebooks he has from 50, he finds the result to be 8.

Solution:-

Let us assume the required number be x

Thrice the number = 3x

The given above statement can be written in the equation form as,

= 50 – 3x = 8

By transposing 50 from LHS to RHS it becomes - 50

= - 3x = 8 - 50

= -3x = - 42

Then,

Divide both side by -3,

= (-3x/-3) = - 42/-3

= x = 14

(f) Ibenhal thinks of a number. If she adds 19 to it and divides the sum by 5, she will get 8.

Solution:-

Let us assume the required number be x

The given above statement can be written in the equation form as,

= (x + 19)/5 = 8

Multiply both side by 5,

= ((x + 19)/5) × 5 = 8 × 5

= x + 19 = 40

Then,

By transposing 19 from LHS to RHS it becomes - 19

= x = 40 - 19

= x = 21

(g) Anwar thinks of a number. If he takes away 7 from 5/2 of the number, the result is 23.

Solution:-

Let us assume the required number be x

5/2 of the number = (5/2) x

The given above statement can be written in the equation form as,

= (5/2) x - 7 = 23

By transposing -7 from LHS to RHS it becomes 7

= (5/2) x = 23 + 7

= (5/2) x = 30

Multiply both side by 2,

= ((5/2) x) × 2 = 30 × 2

= 5x = 60

Then,

Divide both the side by 5

= 5x/5 = 60/5

= x = 12

2. Solve the following:

(a) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. What is the lowest score?

Solution:-

Let us assume the lowest score be x

From the question it is given that,

The highest score is = 87

Highest marks obtained by a student in her class is twice the lowest marks plus 7= 2x + 7

5/2 of the number = (5/2) x

The given above statement can be written in the equation form as,

Then,

= 2x + 7 = Highest score

= 2x + 7 = 87

By transposing 7 from LHS to RHS it becomes -7

= 2x = 87 - 7

= 2x = 80

Now,

Divide both the side by 2

= 2x/2 = 80/2

= x = 40

Hence, the lowest score is 40

(b) In an isosceles triangle, the base angles are equal. The vertex angle is 40°. What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is 180°).

Solution:-

From the question it is given that,

We know that, the sum of angles of a triangle is 180^o

Let base angle be b

Then,

= b + b + 40^o = 180^o

= 2b + 40 = 180^o

By transposing 40 from LHS to RHS it becomes -40

= 2b = 180 – 40

= 2b = 140

Now,

Divide both the side by 2

= 2b/2 = 140/2
= b = 70^o
Hence, 70^o is the base angle of an isosceles triangle.

(c) Sachin scored twice as many runs as Rahul. Together, their runs fell two short of a double century. How many runs did each one score?
Solution:-
Let us assume Rahul's score be x
Then,
Sachin scored twice as many runs as Rahul is 2x
Together, their runs fell two short of a double century,
= Rahul's score + Sachin's score = 200 – 2
= x + 2x = 198
= 3x = 198
Divide both the side by 3,
= 3x/3 = 198/3
= x = 66
So, Rahul's score is 66
And Sachin's score is 2x = 2 × 66 = 132

3. Solve the following:
(i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. How many marbles does Parmit have?
Solution:-
Let us assume number of Parmit's marbles = m
From the question it is given that,
Then,
Irfan has 7 marbles more than five times the marbles Parmit has
= 5 × Number of Parmit's marbles + 7 = Total number of marbles Irfan having
= (5 × m) + 7 = 37
= 5m + 7 = 37
By transposing 7 from LHS to RHS it becomes -7
= 5m = 37 – 7
= 5m = 30
Divide both the side by 5
= 5m/5 = 30/5
= m = 6

So, Permit has 6 marbles

(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?

Solution:-

Let Laxmi's age to be = y years old

From the question it is given that,

Lakshmi's father is 4 years older than three times of her age

= 3 × Laxmi's age + 4 = Age of Lakshmi's father

= (3 × y) + 4 = 49

= 3y + 4 = 49

By transposing 4 from LHS to RHS it becomes -4

= 3y = 49 - 4

= 3y = 45

Divide both the side by 3

= 3y/3 = 45/3

= y = 15

So, Lakshmi's age is 15 years.

(iii) People of Sundargram planted trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees were two more than three times the number of fruit trees. What was the number of fruit trees planted if the number of non-fruit trees planted was 77?

Solution:-

Let the number of fruit tress be f.

From the question it is given that,

3 × number of fruit trees + 2 = number of non-fruit trees

= 3f + 2 = 77

By transposing 2 from LHS to RHS it becomes -2

=3f = 77 – 2

= 3f = 75

Divide both the side by 3

= 3f/3 = 75/3

= f = 25

So, number of fruit tree was 25.

4. Solve the following riddle:

I am a number,

Tell my identity!

Take me seven times over

And add a fifty!

To reach a triple century

You still need forty!

Solution:-

Let us assume the number be x.

Take me seven times over and add a fifty = 7x + 50

To reach a triple century you still need forty = (7x + 50) + 40 = 300

= 7x + 50 + 40 = 300

= 7x + 90 = 300

By transposing 90 from LHS to RHS it becomes -90

= 7x = 300 – 90

= 7x = 210

Divide both side by 7

= 7x/7 = 210/7

= x = 30

Hence the number is 30.