RS Aggrawal Solutions for Class 6 Maths Chapter 9 Linear Equation In One Variable

ANSWER:

(i) Let the required number be *x*.
So, five times the number will be 5x.
∴ 5x = 40

(ii) Let the required number be x.
So, when it is increased by 8, we get x + 8.
∴ x + 8 = 15

(iii) Let the required number be x.
So, when 25 exceeds the number, we get 25 −- x.
∴ 25 −- x = 7

(iv) Let the required number be x.
So, when the number exceeds 5, we get x −- 5.
∴ x −- 5 = 3

(v) Let the required number be x.
So, thrice the number will be 3x.
∴ 3x −- 5 = 16

(vi) Let the required number be x.
So, 12 subtracted from the number will be x −- 12.
∴ x −- 12 = 24

(vii) Let the required number be x.
So, twice the number will be 2x.
∴ 19 −- 2x = 11

(viii) Let the required number be x.
So, the number when divided by 8 will be $\frac{x}{8}$x8.
∴ $\frac{x}{8}$x8 = 7

(ix) Let the required number be x.
So, four times the number will be 4x.
∴ 4x −- 3 = 17

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(x) Let the required number be x.
So, 6 times the number will be 6x.
$\therefore 6x = x + 5$

Page No 140:

ANSWER:

(i) 7 less than the number x equals 14.
(ii) Twice the number y equals 18.
(iii) 11 more than thrice the number x equals 17.
(iv) 3 less than twice the number x equals 13.
(v) 30 less than 12 times the number y equals 6.
(vi) When twice the number z is divided by 3, it equals 8.

Page No 140:

ANSWER:

(i)

$3x - 5 = 7$Substituting $x = 4$ in the given equation:L.H.S. : $3\times4 - 5$or, $12 - 5 = 7$ = R.H.S.L.H.S. = R.H.S. Hence, $x = 4$ is the root of the given equation. 3x - 5 = 7Substituting x = 4 in the given equation:L.H.S. : 3×4 - 5or, 12 - 5 = 7 = R.H.S.L.H.S. = R.H.S. Hence, x = 4 is the root of the given equation.

(ii)

$3 + 2x = 9$Substituting $x = 3$ in the given equation:L.H.S. : $3 + 2\times3$or, $3 + 6 = 9$ = R.H.S. L.H.S. = R.H.S. Hence, $x = 3$ is the root of the given equation. 3 + 2x= 9Substituting x = 3 in the given equation:L.H.S. : 3 + 2×3or, 3 + 6 = 9 = R.H.S. L.H.S. = R.H.S. Hence, x = 3 is the root of the given equation.

(iii)

$5x - 8 = 2x - 2$ Substituting $x = 2$ in the given equation:L.H.S. : R.H.S. :$5\times2 - 8 = 2\times2 - 2$or, $10 - 8 = 2 = 4 - 2 = 2$ L.H.S. = R.H.S. Hence, $x = 2$ is the root of the given equation. 5x - 8 = 2x - 2 Substituting x = 2 in the given equation:L.H.S. : R.H.S. :5×2- 8 = 2×2-2or, 10 - 8 = 2 = 4 -

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2 = 2 L.H.S. = R.H.S. Hence, x =2 is the root of the given equation.

(iv)

8 − 7y = 1 Substituting y = 1 in the given equation:L.H.S. : 8 −7×1or, 8 − 7 = 1 = R.H.S. L.H.S. = R.H.S. Hence, y =1 is the root of the given equation. 8 - 7y = 1 Substituting y = 1 in the given equation:L.H.S. : 8 - 7×1or, 8 - 7 = 1 = R.H.S. L.H.S. = R.H.S. Hence, y =1 is the root of the given equation.

(v)

z7 = 8 Substituting z = 56 in the given equation:L.H.S. : 567 = 8 =R.H.S.L.H.S. = R.H.S. Hence, z =56 is the root of the given equation.z7 = 8 Substituting z = 56 in the given equation:L.H.S. : 567 = 8 =R.H.S.L.H.S. = R.H.S. Hence, z =56 is the root of the given equation.

Page No 140:

ANSWER:

(i) y + 9 = 13

We try several values of y until we get the L.H.S. equal to the R.H.S.

y	L.H.S.	R.H.S.	Is LHS =RHS ?
1	1 + 9 = 10	13	No
2	2 + 9 = 11	13	No
3	3 + 9 = 12	13	No
4	4 + 9 = 13	13	Yes

∴ y = 4

(ii) x − 7= 10

We try several values of x until we get the L.H.S. equal to the R.H.S.

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
10	10 − 7 = 3	10	No
11	11 − 7 = 4	10	No
12	12 − 7 = 5	10	No

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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

$\therefore x = 17$

(iii) $4x = 28$

We try several values of x until we get the L.H.S. equal to the R.H.S.

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
1	$4 \times\times 1 = 4$	28	No
2	$4 \times\times 2 = 8$	28	No
3	$4 \times\times 3 = 12$	28	No
4	$4 \times\times 4 = 16$	28	No
5	$4 \times\times 5 = 20$	28	No
6	$4 \times\times 6 = 24$	28	No
7	$4 \times\times 7 = 28$	28	Yes

$\therefore x = 7$

(iv) $3y = 36$

We try several values of x until we get the L.H.S. equal to the R.H.S.

y	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
6	$3 \times\times 6 = 18$	36	No
7	$3 \times\times 7 = 21$	36	No
8	$3 \times\times 8 = 24$	36	No

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9	3 ×× 9 = 27	36	No
10	3 ×× 10 = 30	36	No
11	3 ××11 = 33	36	No
12	3 ×× 12 = 36	36	Yes

∴ y = 12

(v) 11 + *x* = 19

We try several values of x until we get the L.H.S. equal to the R.H.S.

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
1	11 + 1 = 12	19	No
2	11 + 2 = 13	19	No
3	11 + 3 = 14	19	No
4	11 + 4 = 15	19	No
5	11 + 5 = 16	19	No
6	11 + 6 = 17	19	No
7	11 + 7 = 18	19	No
8	11 + 8 = 19	19	Yes

∴ x = 8

(vi) $_{x3}$ = 4x3 = 4

Since R.H.S. is an natural number so L.H.S. must also be a natural number. Thus, x has to be a multiple of 3.

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
3	$_{33}$=133=1	4	No
6	$_{63}$=263=2	4	No
9	$_{93}$=393=3	4	No
12	$_{123}$=4123=4	4	Yes

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∴ x = 12

(vii) $2x - 3 = 9$

We try several values of x until we get the L.H.S. equal to the R.H.S.

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
1	2 ×× 1 − 3 = −1	9	No
2	2 ×× 2 − 3 = 1	9	No
3	2 ×× 3 − 3 = 3	9	No
4	2 ×× 4 − 3 = 5	9	No
5	2 ×× 5 − 3 = 7	9	No
6	2 ×× 6 − 3 = 9	9	Yes

∴ x = 6

(viii) $12x + 7 = 1112x + 7 = 11$

Since, R.H.S. is a natural number so L.H.S. must be a natural number
Thus, we will try values if x which are multiples of 'x'

x	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
2	2/2 + 7 = 8	11	No
4	4/2 + 7 = 9	11	No
6	6/2 + 7 = 10	11	No
8	8/2 + 7 = 11	11	Yes

∴ x = 8

(ix) $2y + 4 = 3y$

We try several values of y until we get the L.H.S. equal to the R.H.S.

y	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
1	2 ×× 1 + 4 = 6	3 ×× 1 = 3	No
2	2 ×× 2 + 4 = 8	3 ×× 2 = 6	No

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3	$2 \times\times 3 + 4 = 10$	$3 \times\times 3 = 9$	No
4	$2 \times\times 4 + 4 = 12$	$3 \times\times 4 = 12$	Yes

$\therefore y = 4$

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

We try several values of z till we get the L.H.S. equal to the R.H.S.

z	L.H.S.	R.H.S.	Is L.H.S. = R.H.S.?
1	$1 - 3 = -2$	$2 \times\times 1 - 5 = -3$	No
2	$2 - 3 = -1$	$2 \times\times 2 - 5 = -1$	Yes

$\therefore z = 2$

Page No 143:

ANSWER:

$x + 5 = 12$

Subtracting 5 from both the sides:
$\Rightarrow x + 5 - 5 = 12 - 5$
$\Rightarrow x = 7$
Verification:
Substituting x = 7 in the L.H.S.:
$\Rightarrow 7 + 5 = 12 = R.H.S.$
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$x + 3 = -2$

Subtracting 3 from both the sides:
$\Rightarrow x + 3 - 3 = -2 - 3$
$\Rightarrow x = -5$

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Verification:
Substituting x = −5 in the L.H.S.:
⇒ −5 + 3 = −2 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

x − 7 = 6
Adding 7 on both the sides:
⇒ x − 7 + 7 = 6 + 7
⇒ x = 13

Verification:
Substituting x = 13 in the L.H.S.:
⇒ 13 − 7 = 6 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

x − 2 = −5

Adding 2 on both sides:
⇒ x − 2 + 2 = −5 + 2
⇒ x = −3
Verification:
Substituting x = −3 in the L.H.S.:
⇒ −3 − 2 = −5 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

3x − 5 = 13
⇒ 3x − 5 + 5 = 13 + 5 [Adding 5 on both the sides]

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⇒ 3x = 18
⇒ $\frac{3x}{3} = \frac{18}{3}$3x3 = 183 [Dividing both the sides by 3]
⇒ x = 6
Verification:
Substituting x = 6 in the L.H.S.:
⇒ 3 ×× 6 − 5 = 18 − 5 = 13 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

4*x* + 7 = 15
⇒ 4x + 7 − 7 = 15 − 7 [Subtracting 7 from both the sides]
⇒ 4x = 8
⇒ $\frac{4x}{4} = \frac{8}{4}$4x4 = 84 [Dividing both the sides by 4]
⇒ x = 2
Verification:
Substituting x = 2 in the L.H.S.:
⇒ 4××2 + 7 = 8 + 7 = 15 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{x}{5} = 12$x5 = 12
⇒ $\frac{x}{5}\times 5 = 12\times 5$x5×5 = 12×5 [Multiplying both the sides by 5]
⇒ x = 60
Verification:
Substituting x = 60 in the L.H.S.:
⇒ $\frac{60}{5}$605 = 12 = R.H.S.
⇒ L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{3x}{5} = 15$3x5 = 15
⇒ $\frac{3x}{5}\times 5 = 15 \times 5$3x5× 5 = 15 × 5 [Multiplying both the sides by 5]

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⇒ 3x = 75
⇒ 3x3 = 753x3 = 753
⇒ x = 25
Verification:
Substituting x = 25 in the L.H.S.:
⇒ 3 × 2553 × 255 = 15 = R.H.S.
⇒ L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

5*x* − 3 = *x* + 17
⇒ 5*x* − x = 17 + 3 [Transposing x to the L.H.S. and 3 to the R.H.S.]
⇒ 4x = 20
⇒ 4x4 = 2044x4 = 204 [Dividing both the sides by 4]
⇒ x = 5
Verification:
Substituting x = 5 on both the sides:
L.H.S.: 5(5) − 3
⇒ 25 − 3
⇒ 22

R.H.S.: 5 + 17 = 22
⇒ L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

2x−12 = 32x-12 = 3
⇒ 2x −-1212 + 1212 = 3 + 1212 [Adding 1212 on both the sides]
⇒ 2x = 6 + 126 + 12
⇒ 2x = 7272
⇒ 2x2 = 72 × 22x2 = 72 × 2 [Dividing both the sides by 3]
⇒ x = 7474
Verification:
Substituting x = 7474 in the L.H.S.:
2(74) − 12= 72 − 12 = 62 = 3 = R.H.S.274 - 12= 72 - 12 = 62 = 3 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

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Page No 143:

ANSWER:

3(x + 6) = 24
⇒ $3\times x + 3\times 6 = 24$3×x + 3×6 = 24 [On expanding the brackets]
⇒ 3x + 18 = 24
⇒ 3x + 18 −- 18 = 24 −- 18 [Subtracting 18 from both the sides]
⇒ 3x = 6
⇒ $\frac{3x}{3} = \frac{6}{3}$3x3 = 63 [Dividing both the sides by 3]
⇒ x = 2
Verification:
Substituting x = 2 in the L.H.S.:
3(2 + 6) = 3 ×××8 = 24 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

6x + 5 = 2x + 17
⇒⇒6x −- 2x = 17 −- 5 [Transposing 2x to the L.H.S. and 5 to the R.H.S.]
⇒⇒4x = 12
⇒⇒$\frac{4x}{4} = \frac{12}{4}$4x4= 124 [Dividing both the sides by 4]
⇒⇒x = 3
Verification:
Substituting x = 3 on both the sides:
L.H.S.: 6(3) + 5
=18 + 5
=23
R.H.S.: 2(3) + 17
= 6 + 17
= 23
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{x}{4} - 8 = 1$x4- 8 = 1
⇒$\frac{x}{4} - 8 + 8 = 1 + 8$⇒x4- 8 + 8 = 1 + 8 [Adding 8 on both the sides]

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$\Rightarrow \frac{x}{4} = 9 \Rightarrow \frac{x}{4} = 9$
$\Rightarrow \frac{x}{4} \times 4 = 9 \times 4 \Rightarrow \frac{x}{4} \times 4 = 9 \times 4$ [Multiplying both the sides by 4]
or, x = 36
Verification:
Substituting x = 36 in the L.H.S.:
or, $\frac{36}{4} - 8$ 36/4 - 8 = 9 − 8 = 1 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{x}{2} = \frac{x}{3} + 1$ x/2 = x/3 + 1
$\Rightarrow \frac{x}{2} - \frac{x}{3} = 1 \Rightarrow$ x/2 - x/3 = 1 [Transposing $\frac{x}{3}$ x/3 to the L.H.S.]
$\Rightarrow \frac{3x - 2x}{6} = 1 \Rightarrow$ (3x - 2x)/6 = 1
$\Rightarrow \frac{x}{6} = 1 \Rightarrow$ x/6 = 1
$\Rightarrow \frac{x}{6} \times 6 = 1 \times 6 \Rightarrow$ x/6 × 6 = 1 × 6 [Multiplying both the sides by 6]
or, x = 6
Verification:
Substituting x = 6 on both the sides:
L.H.S.: $\frac{6}{2}$ 6/2 = 3
R.H.S.: $\frac{6}{3} + 1$ 6/3 + 1 = 2 + 1 = 3
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$3(x + 2) - 2(x - 1) = 7$
$\Rightarrow 3 \times x + 3 \times 2 - 2 \times x - 2 \times (-1) = 7 \Rightarrow$ 3×x + 3×2 - 2×x -2×(-1) = 7 [On expanding the brackets]
or, 3x + 6 −-2x + 2 = 7
or, x + 8 = 7
or, x + 8 −- 8 = 7 −- 8 [Subtracting 8 from both the sides]
or, x = −-1
Verification:
Substituting x = −-1 in the L.H.S.:
$3(-1+2) - 2(-1-1)$ or, $3(1) - 2(-2)$ or, $3 + 4 = 7 = R.H.S.$ 3(-1+2) -2(-1-1)or, 3(1) -2(-2)or, 3 + 4 = 7 = R.H.S.

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L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

5(x-1) +2(x+3) + 6 = 0
⇒⇒5x -5 +2x +6 +6 = 0 (Expanding within the brackets)
⇒⇒7x +7 = 0
⇒⇒x +1 = 0 (Dividing by 7)
⇒⇒x = -1

Verification:
Putting x = -1 in the L.H.S.:
L.H.S.: 5(-1 -1) + 2(-1 + 3) + 6
= 5(-2) + 2(2) + 6
= -10 + 4 + 6 = 0 = R.H.S.

Hence, verified.

Page No 143:

ANSWER:

6(1 − 4*x*) + 7(2 + 5*x*) = 53
or, $6 \times 1 - 6 \times 4x + 7 \times 2 + 7 \times 5x = 536 \times 1$ - 6 × 4x + 7 × 2 + 7 × 5x = 53 [On expanding the brackets]
or, 6 −- 24x + 14 + 35x = 53
or, 11x + 20 = 53
or, 11x + 20 −- 20 = 53 −- 20 [Subtracting 20 from both the sides]
or, 11x = 33
or, $11x11 = 3311$11x11= 3311 [Dividing both the sides by 11]
or, x = 3
Verification:
Substituting x = 3 in the L.H.S.:
$6(1 - 4 \times 3) + 7(2 + 5 \times 3) \Rightarrow 6(1 - 12) + 7(2 + 15) \Rightarrow 6(-11) + 7(17) \Rightarrow -66 + 119 = 53$
= R.H.S.6(1 - 4 × 3) + 7(2 + 5 × 3)⇒6(1 - 12) + 7(2 + 15)⇒6(-11) + 7(17)⇒-66 + 119 = 53 = R.H.S.

L.H.S. = R.H.S.
Hence, verified.

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Page No 143:

ANSWER:

16(3*x* − 5) − 10(4*x* − 8) = 40
or, $16 \times 3x - 16 \times 5 - 10 \times 4x - 10 \times (-8) = 40$16 × 3x - 16 × 5 -10 × 4x - 10 × (-8) = 40 [On expanding the brackets]
or, 48x −- 80 −- 40x + 80 = 40
or, 8x = 40
or, $\frac{8x}{8} = \frac{40}{8}$8x8=408 [Dividing both the sides by 8]
or, x = 5
Verification:
Substituting x = 5 in the L.H.S.:

$16(3 \times 5 - 5) - 10(4 \times 5 - 8) \Rightarrow 16(15 - 5) - 10(20 - 8) \Rightarrow 16(10) - 10(12) \Rightarrow 160 - 120 = 40 = \text{R.H.S.}$16(3 × 5 - 5) - 10(4 × 5 - 8)⇒16(15 - 5) - 10(20 - 8)⇒16(10) - 10(12)⇒160 - 120 = 40 = R.H.S.

L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

3(*x* + 6) + 2(*x* + 3) = 64
⇒⇒3 × x + 3 × 6 + 2 × x + 2 × 3 = 64 [On expanding the brackets]
⇒⇒3x + 18 + 2x + 6 = 64
⇒5x + 24 = 64
⇒5x + 24 −- 24 = 64 −- 24 [Subtracting 24 from both the sides]
⇒5x = 40
⇒$\frac{5x}{5} = \frac{40}{5}$5x5 = 405 [Dividing both the sides by 5]
⇒x = 8
Verification:
Substituting x = 8 in the L.H.S.:
$3(8 + 6) + 2(8 + 3) 3(14) + 2(11) 42 + 22 = 64 = \text{R.H.S.}$3(8 + 6) + 2(8 + 3)3(14) + 2(11)42 + 22 = 64 = R.H.S.

L.H.S. = R.H.S.
Hence, verified.

Page No 143:

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ANSWER:

$3(2 - 5x) - 2(1 - 6x) = 1$
or, $3 \times 2 + 3 \times (-5x) - 2 \times 1 - 2 \times (-6x) = 1$ [On expanding the brackets]
or, $6 - 15x - 2 + 12x = 1$
or, $4 - 3x = 1$
or, $3 = 3x$
or, $x = 1$

Verification:
Substituting x = 1 in the L.H.S.:
$3(2 - 5 \times 1) - 2(1 - 6 \times 1) \Rightarrow 3(2 - 5) - 2(1 - 6) \Rightarrow 3(-3) - 2(-5) \Rightarrow -9 + 10 = 1 = \text{R.H.S.}$
3(2 - 5 × 1) - 2(1 - 6 × 1)⇒3(2 - 5) - 2(1- 6)⇒3(-3) -2(-5)⇒-9 + 10 = 1 = R.H.S.
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{n}{4} - 5 = \frac{n}{6} + 12$ n/4-5 = n/6 + 12
or, $\frac{n}{4} - \frac{n}{6} = 12 + 5$ n/4 - n/6 = 12 + 5 [Transposing n/6 to the L.H.S. and 5 to the R.H.S.]
or, $\frac{3n - 2n}{12} = 1 + 102$ (3n-2n)/12 = 1+102
or, $\frac{n}{12} = 112$ n/12 = 112
or, $\frac{n}{12} \times 12 = 112 \times 12$ n/12×12 = 112×12 [Dividing both the sides by 12]
or, n = 66
Verification:
Substituting n = 66 on both the sides:

L.H.S.:
$\frac{66}{4} - 5 = 33 - 5 = 33 - 10 = 23$ R.H.S.: $\frac{66}{6} + 12 = 11 + 12 = 22 + 12 = 23$ 66/4-5 =33 - 5 =33 - 10 =23 R.H.S.: 66/6+12= 11 + 12 = 22+12= 23
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{2m}{3} + 8 = \frac{m}{2} - 1$ 2m/3 + 8 = m/2- 1
or, $\frac{2m}{3} - \frac{m}{2} = -1 - 8$ 2m/3 - m/2 = -1 -8 [Transposing m/2 to the L.H.S. and 8 to the R.H.S.]

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or, $\frac{4m-3m}{6} = -9$or, $\frac{m}{6} = -9$or, 4m-3m6 = -9or, m6 = -9
or, $\frac{m}{6} \times 6 = -9 \times 6$m6×6 = -9×6 [Multiplying both the sides by 6]
or, m = −-54
Verification:
Substituting x = −54 on both the sides:

L.H.S.: $2(-54)3 + 8 = -542 - 1 = -1083 + 8 = -36 + 8 = -28$ R.H.S.:$-542 - 1 = -27 - 1 = -28$L.H.S.: 2(-54)3 + 8 = -542-1= -1083 + 8 = -36+ 8 = -28 R.H.S.:-542-1 = -27 - 1= -28
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{2x}{5} - 32 = \frac{x}{2} + 1$2x5 -32 = x2 + 1
or, $\frac{2x}{5} - \frac{x}{2} = 1 + 32$2x5- x2 = 1+ 32 [Transposing x/2 to the L.H.S. and 3/2 to R.H.S.]
or, $\frac{4x-5x}{10} = \frac{2+32}{}$or, $\frac{-x}{10} = 52$or, 4x-5x10= 2+32or, -x10 = 52
or, $\frac{-x}{10}(-10) = 52 \times (-10)$or, -x10(-10) =52 ×(-10) [Multiplying both the sides by −10]
or, x = −25
Verification:
Substituting x = −25 on both the sides:
L.H.S.: $2(-25)5 - 32 = -505 - 32 = -10 - 32 = -232$R.H.S.: $-252 + 1 = -25 + 22 = -232$L.H.S.: 2(-25)5 - 32 = -505 - 32 = -10 - 32 = -232R.H.S.: -252+ 1= -25 + 22 = -232
L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$\frac{x-3}{5} - 2 = \frac{2x}{5}$ x-35 - 2 = 2x5
or, $\frac{x}{5} - \frac{3}{5} - 2 = \frac{2x}{5}$x5- 35 -2 = 2x5
or, $-\frac{3}{5} - 2 = \frac{2x}{5} - \frac{x}{5}$- 35- 2 = 2x5-x5 [Transposing x/5 to the R.H.S.]
or, $\frac{-3-10}{5} = \frac{x}{5}$-3- 105 = x5
or, $\frac{-13}{5} = \frac{x}{5}$-135 = x5
or, $\frac{-13}{5}(5) = \frac{x}{5} \times (5)$-135(5) =x5 ×(5) [Multiplying both the sides by 5]
or, x = −13
Verification:
Substituting x = −13 on both the sides:

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L.H.S.: $-13-35-2=-165-2=-16-105=-265$R.H.S.: $2\times(-13)5=-265$ L.H.S.: -13 - 35 - 2 =-165 - 2= -16 - 105 = -265R.H.S.: 2×(-13)5 = -265

L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$3x10-4=14$ 3x10 - 4 = 14
or, $3x10-4+4=14+4$3x10- 4 + 4= 14 + 4 [Adding 4 on both the sides]
or, $3x10=18$3x10 = 18
or, $3x10\times10=18\times10$3x10×10 = 18×10 [Multiplying both the sides by 10]
or, $3x=180$3x = 180
or, $3x3=1803$3x3 = 1803 [Dividing both the sides by 3]
or, x = 60
Verification:
Substituting x = 60 on both the sides:
$3\times6010-4=18010-4=18-4=14=$R.H.S.3×6010 - 4 =18010 - 4 = 18 - 4 = 14 = R.H.S.

L.H.S. = R.H.S.
Hence, verified.

Page No 143:

ANSWER:

$34(x-1)=x-3$34x-1 = x - 3
$\Rightarrow34\times x-34\times1=x-3\Rightarrow$34×x - 34 × 1= x - 3 [On expanding the brackets]
$\Rightarrow3x4-34=x-3\Rightarrow$3x4- 34 = x - 3
$\Rightarrow3x4-x=-3+34\Rightarrow$3x4- x = -3 + 34 [Transposing x to the L.H.S. and -34-34 to the R.H.S.]
$\Rightarrow3x-4x4=-12+34\Rightarrow$3x-4x4= -12+34
$\Rightarrow-x4=-94\Rightarrow$-x4 = -94
$\Rightarrow-x4\times(-4)=-94\times(-4)\Rightarrow$-x4×-4 = -94×-4 [Multiplying both the sides by -4]
or, x = 9

Verification:
Substituting x = 9 on both the sides:
L.H.S. : $34(9-1)=34(8)=6$ R.H.S.: $9-3=6$L.H.S. : 349-1 = 34(8) = 6 R.H.S.: 9 - 3 = 6

Aakash Institute

L.H.S. = R.H.S.
Hence, verified.

Page No 144:

ANSWER:

Let the required number be x.
According to the question:
9 + x = 36
or, x + 9 −- 9 = 36 −- 9 [Subtracting 9 from both the sides]
or, x = 27
Thus, the required number is 27.

Page No 144:

ANSWER:

Let the required number be x.
According to the question:
4x −-11 = 89
or, 4x −- 11 +11 = 89 + 11 [Adding 11 on both the sides]
or, 4x = 100
or, 4x4 = 10044x4 = 1004 [Dividing both the sides by 4]
or, x = 25
Thus, the required number is 25.

Page No 144:

ANSWER:

Let the required number be x.
According to the question:
or, 5x = x + 80
or, 5x −- x = 80 [Transposing x to the L.H.S.]
or, 4x = 80
or, 4x4 = 8044x4 = 804 [Dividing both the sides by 4]
or, x = 20
Thus, the required number is 20.

Aakash Institute

Page No 144:

ANSWER:

Let the three consecutive natural numbers be x, (x+1), (x+2).
According to the question:
x + (x + 1) + (x + 2) = 114
or, x + x + 1 + x + 2 = 114
or, 3x + 3 = 114
or, 3x + 3 −- 3 = 114 −- 3 [Subtracting 3 from both the sides]
or, 3x = 111
or, 3x3 = 11133x3 = 1113 [Dividing both the sides by 3]
or, x = 37
Required numbers are:
x = 37
or, x + 1 = 37 + 1 = 38
or ,x + 2 = 37 + 2 = 39
Thus, the required numbers are 37, 38 and 39.

Page No 144:

ANSWER:

Let the required number be x.
When Raju multiplies it with 17, the number becomes 17x.
According to the question :
17x + 4 = 225
or, 17x + 4 −- 4 = 225 −- 4 [Subtracting 4 from both the sides]
or, 17x = 221
or, 17x17 = 2211717x17 = 22117 [Dividing both the sides by 17]
or, x = 13
Thus, the required number is 13.

Page No 144:

ANSWER:

Let the required number be x.
According to the question, the number is tripled and 5 is added to it
∴ 3x + 5
or, 3x + 5 = 50
or, 3x + 5 −- 5 = 50 −- 5 [Subtracting 5 from both the sides]
or, 3x = 45

Aakash Institute

or, $\frac{3x}{3} = \frac{45}{3}$ 3x3 =453 [Dividing both the sides by 3]
or, x = 15
Thus, the required number is 15.

Page No 144:

ANSWER:

Let one of the number be x.
∴ The other number = (x + 18)
According to the question:
x + (x + 18) = 92
or, 2x + 18 −- 18 = 92 −- 18 [Subtracting 18 from both the sides]
or, 2x =74
or, $\frac{2x}{2} = \frac{74}{2}$ 2x2 = 742 [Dividing both the sides by 2]
or, x = 37
Required numbers are:
x = **37**
or, x + 18 = 37 + 18 = **55**

Page No 144:

ANSWER:

Let one of the number be 'x'
∴ Second number = 3x
According to the question:
x + 3x = 124
or, 4x = 124
or, $\frac{4x}{4} = \frac{124}{4}$ 4x4 = 1244 [Dividing both the sides by 4]
or, x = 31
Thus, the required number is x = **31** and 3x = 3××31 = **93**.

Page No 144:

ANSWER:

Let one of the number be x.
∴ Second number = 5x
According to the question:
5x −- x = 132
or, 4x = 132
or, $\frac{4x}{4} = \frac{132}{4}$ 4x4 = 1324 [Dividing both the sides by 4]

Aakash Institute

or, x = 33
Thus, the required numbers are x = **33** and 5x = 5××33 = **165**.

Page No 144:

ANSWER:

Let one of the even number be x.
Then, the other consecutive even number is (x + 2).
According to the question:
x + (x + 2) = 74
or, 2x + 2 = 74
or, 2x + 2 −- 2 = 74 −- 2 [Subtracting 2 from both the sides]
or, 2x = 72
or, 2x2 = 7222x2 = 722 [Dividing both the sides by 2]
or, x = 36
Thus, the required numbers are x = **36** and x+ 2 = **38.**

Page No 144:

ANSWER:

Let the first odd number be x.
Then, the next consecutive odd numbers will be (x + 2) and (x + 4).
According to the question:
x + (x + 2) + (x + 4) = 21
or, 3x + 6 = 21
or, 3x + 6 −- 6 = 21 −- 6 [Subtracting 6 from both the sides]
or, 3x = 15
or, 3x3 = 1533x3 = 153 [Dividing both the sides by 3]
or, x = 5
∴ Required numbers are:
x = **5**
x + 2 = 5 + 2 = **7**
x + 4 = 5 + 4 = **9**

Page No 144:

ANSWER:

Let the present age of Ajay be x years.
Since Reena is 6 years older than Ajay, the present age of Reena will be (x+ 6) years.
According to the question:

Aakash Institute

x + (x + 6) = 28
or, 2x + 6 = 28
or, 2x + 6 −- 6 = 28 −- 6 [Subtracting 6 from both the sides]
or, 2x = 22
or, 2x2 = 2222x2 = 222 [Dividing both the sides by 2]
or, x = 11
∴ Present age of Ajay = **11 years**
Present age of Reena = x +6 = 11 + 6
= **17 years**

Page No 144:

ANSWER:

Let the present age of Vikas be x years.
Since Deepak is twice as old as Vikas, the present age of Deepak will be 2x years.
According to the question:
2x −- x = 11
x = 11
∴ Present age of Vikas = **11 years**
Present age of Deepak = 2x = 2××11
= **22 years**

Page No 144:

ANSWER:

Let the present age of Rekha be x years.
As Mrs. Goel is 27 years older than Rekha, the present age of Mrs. Goel will be (x + 27) years.
After 8 years:
Rekha's age = (x + 8) years
Mrs. Goel's age = (x + 27 + 8)
= (x + 35) years

According to the question:
(x + 35) = 2(x + 8)
or, x + 35 = 2××x + 2××8 [On expanding the brackets]
or, x + 35 = 2x + 16
or, 35 −- 16 = 2x −- x [Transposing 16 to the L.H.S. and x to the R.H.S.]
or, x = 19
∴ Present age of Rekha = **19 years**
Present age of Mrs. Goel = x + 27

Aakash Institute

= 19 + 27
= **46 years**

Page No 145:

ANSWER:

Let the present age of the son be x years.
As the man is 4 times as old as his son, the present age of the man will be (4x) years.
After 16 years:
Son's age = (x + 16) years
Man's age = (4x + 16) years

According to the question:
(4x + 16) = 2(x + 16)
or, 4x + 16 = 2××x + 2××16 [On expanding the brackets]
or, 4x + 16 = 2x + 32
or, 4x −- 2x = 32 −- 16 [Transposing 16 to the R.H.S. and 2x to the L.H.S.]
or, 2x = 16
or, 2x2 = 1622x2 = 162 [Dividing both the sides by 2]
or, x = 8
∴ Present age of the son = **8 years**
Present age of the man = 4x = 4××8
= **32 years**

Page No 145:

ANSWER:

Let the present age of the son be x years.
As the man is 3 times as old as his son, the present age of the man will be (3x) years.

5 years ago:
Son's age = (x −- 5) years
Man's age = (3x −- 5) years

According to the question:
(3x −- 5) = 4(x −- 5)
or, 3x −- 5 = 4××x −- 4××5 [On expanding the brackets]
or, 3x −- 5 = 4x −- 20

Aakash Institute

or, 20 −- 5 = 4x −- 3x [Transposing 3x to the R.H.S. and 20 to the L.H.S.]
or, x = 15
∴ Present age of the son = **15 years**
Present age of the man = 3x = 3××15
= **45 years**

Page No 145:

ANSWER:

Let the present age of Fatima be x years.

After 16 years:
Fatima's age = (x + 16) years

According to the question:
x + 16 = 3(x)
or, 16 = 3x −- x [Transposing x to the R.H.S.]
or, 16 = 2x
or, 2x2 = 1622x2 = 162 [Dividing both the sides by 2]
or, x = 8
∴ Present age of Fatima = 8 years

Page No 145:

ANSWER:

Let the present age of Rahim be x years.
After 32 years:
Rahim's age = (x + 32) years
8 years ago:
Rahim's age = (x −- 8) years
According to the question:
x + 32 = 5(x −- 8)
or, x + 32 = 5x −- 5××8
or, x + 32 = 5x −- 40
or, 40 + 32 = 5x −- x [Transposing 'x' to the R.H.S. and 40 to the L.H.S.]
or, 72 = 4x
or, 4x4 = 7244x4 = 724 [Dividing both the sides by 4]
or, x = 18
Thus, the present age of Rahim is 18 years.

Page No 145:

Aakash Institute

ANSWER:

Let the number of 50 paisa coins be x.
Then, the number of 25 paisa coins will be 4x.
According to the question:
0.50(x) + 0.25(4x) = 30
or, 0.5x + x = 30
or, 1.5x = 30
or, $\frac{1.5x}{1.5} = \frac{30}{1.5}$1.5x1.5 = 301.5 [Dividing both the sides by 1.5]
or, x = 20
Thus, the number of 50 paisa coins is 20.
Number of 25 paisa coins = 4x = 4××20 = 80

Page No 145:

ANSWER:

Let the price of one pen be Rs x.
According to the question:
5x = 3x + 17
or, 5x −- 3x = 17 [Transposing 3x to the L.H.S.]
or, 2x = 17
or, $\frac{2x}{2} = \frac{17}{2}$2x2 = 172 [Dividing both the sides by 2]
or, x = 8.50
∴ Price of one pen = Rs 8.50

Page No 145:

ANSWER:

Let the number of girls in the school be x.
Then, the number of boys in the school will be (x + 334).
Total strength of the school = 572

∴ x + (x + 334) = 572
or, 2x + 334 = 572
or, 2x + 334 −- 334 = 572 −- 334 {Subtracting 334 from both the sides]
or, 2x = 238
or, $\frac{2x}{2} = \frac{238}{2}$2x2 = 2382 [Dividing both the sides by 2]
or, x = 119
∴ Number of girls in the school = 119

Page No 145:

Aakash Institute

ANSWER:

Let the breadth of the park be x metres.
Then, the length of the park will be 3*x* metres.
Perimeter of the park = 2 (Length + Breadth) = 2 (3*x* + *x*) m
Given perimeter = 168 m

∴ 2(3x + x) = 168
or, 2 (4x) = 168
or, 8x = 168 [On expanding the brackets]
or, $\frac{8x}{8} = \frac{168}{8}$ 8x8 = 1688 [Dividing both the sides by 8]
or, x = 21 m
∴ Breadth of the park = *x* = **21 m**
Length of the park = 3*x* = 3××21 = **63 m**

Page No 145:

ANSWER:

Let the breadth of the hall be x metres.
Then, the length of the hall will be (*x* + 5) metres.
Perimeter of the hall = 2(Length + Breadth) = 2(*x* + *5* + *x*) metres
Given perimeter of the rectangular hall = 74 metres

∴ 2*(x* + *5* + *x*) = 74
or, 2 (2*x* + 5) = 74
or, 2 ×2*x* + 2 ×5 = 74 [On expanding the brackets]
or, 4*x* + 10 = 74
or, 4*x* + 10 −- 10 = 74 −- 10 [Subtracting 10 from both the sides]
or, 4*x* = 64
or, $\frac{4x}{4} = \frac{64}{4}$ 4x4 = 644 [Dividing both the sides by 4]
or, x = 16 metres
∴ Breadth of the park = *x*
= **16 metres**
Length of the park = *x* + 5 = 16 + 5
= **21 metres**

Page No 145:

ANSWER:

Let the breadth of the rectangle be x cm.
Then, the length of the rectangle will be (x + 7) cm.

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Perimeter of the rectangle = 2(Length + Breadth) = 2(x + 7 + x) cm
Given perimeter of the rectangle = Length of the wire = 86 cm

∴ 2(x + 7 + x) = 86
or, 2 (2x + 7) = 86
or, 2 ×2x + 2 × 7 = 86 [On expanding the brackets]
or, 4x + 14 = 86
or, 4x + 14 - 14 = 86 - 14 [Subtracting 14 from both the sides]
or, 4x = 72
or, 4x4 = 724 4x4 = 724 [Dividing by 4 on both the sides]
or, x = 18 metres
Breadth of the hall = x
= **18 metres**
Length of the hall = x + 7
= 18 + 7
= **25 metres**

Page No 146:

ANSWER:

Earning of the man per hour = Rs 25

Earning of the man in *x* hours = Rs (25××*x*)
= Rs 25*x*

Page No 146:

ANSWER:

Cost of 1 pen = Rs 16
∴ Cost of '*x*' pens = Rs 16 ×× *x*
= Rs 16*x*
Similarly, cost of 1 pencil = Rs 5
∴ Cost of '*y*' pencils = Rs 5××*y*
= Rs 5*y*
∴ Total cost of *x* pens and *y* pencils = Rs (16*x* + 5*y)*

Page No 146:

Aakash Institute

ANSWER:

Lalit's earning per day = Rs x
∴ Lalit's earning in 30 days = Rs 30 ××x
= Rs 30x

Similarly, Lalit's expenditure per day = Rs y
∴ Lalit's expenditure in 30 days = Rs 30 ×× y
= Rs 30y
∴ In 30 days, Lalit saves = (Total earnings −- Total expenditure)
= Rs (30x −- 30y)
= Rs 30(x - y)

Page No 146:

ANSWER:

Let the required number be x.
Three times this number is 3x.
On adding 8, the number becomes 3x + 8.
3x + 8 = 20
or, 3x + 8 −- 8 = 20 −- 8 [Subtracting 8 from both the sides]
or, 3x = 12
or, $\frac{3x}{3} = \frac{12}{3}$3x3 = 123 [Dividing both the sides by 3]
or, x = 4
∴ Required number = 4

Page No 146:

ANSWER:

Given:
x =1
y = 2
z = 3

Substituting x = 1, y = 2 and z = 3 in the given equation ($x^2 + y^2 + 2xyz$):

$(1)^2 +(2)^2 + 2(1)(2)(3) \Rightarrow 1 + 4 + 12 = 17$12 + 22 + 2123⇒1 + 4 + 12 = 17

Page No 146:

ANSWER:

Aakash Institute

$4x + 9 = 17$
or, $4x + 9 - 9 = 17 - 9$ [Subtracting 9 from both the sides]
or, $4x = 8$
or, $\frac{4x}{4} = \frac{8}{4}$4x4 = 84 [Dividing both the sides with 4]
or, $x = 2$

Page No 146:

ANSWER:

$3(x + 2) - 2(x - 1) = 7.$
or, $3 \times x + 3 \times 2 - 2 \times x - 2 \times (-1) = 7$3 × x + 3 × 2 - 2 × x - 2 × (-1) = 7 [On expanding the brackets]
or, $3x + 6 - 2x + 2 = 7$
or, $x + 8 = 7$
or, $x + 8 - 8 = 7 - 8$ [Subtracting 8 from both the sides]
or, $x = -1$

Page No 146:

ANSWER:

$\frac{2x}{5} - \frac{x}{2} = \frac{5}{2}$2x5 -x2 = 52
or, $\frac{4x - 5x}{10} = \frac{5}{2}$4x - 5x10 = 52 [Taking the L.C.M. as 10]
or, $\frac{-x}{10} = \frac{5}{2}$-x10 = 52
or, $\frac{-x}{10} \times (-10) = \frac{5}{2} \times (-10)$-x10×-10 = 52×-10 [Multiplying both the sides by (−10)]
or, $x = -25$

Page No 146:

ANSWER:

Let the three consecutive natural numbers be x, (x + 1) and (x + 2).

$\therefore x + (x + 1) + (x + 2) = 51$
$3x + 3 = 51$
$3x + 3 - 3 = 51 - 3$ [Subtracting 3 from both the sides]
$3x = 48$
$\frac{3x}{3} = \frac{48}{3}$3x3 = 483 [Dividing both the sides by 3]
$x = 16$
Thus, the three natural numbers are x = 16, x+1 = 17 and x+2 = 18.

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Page No 146:

ANSWER:

Let the present age of Seema be x years.
After 16 years:
Seema's age = x + 16

After 16 years, her age becomes thrice of her age now
∴ x + 16 = 3x
or, 16 = 3x —- x [Transposing x to the R.H.S.]
or, 2x = 16
or, 2x2 = 162 2x2 = 162 [Dividing both the sides by 2]
or, x = 8 years

Page No 146:

ANSWER:

(c) 5 − 2*x* + 3y

1 exceeds 2*x* − 3*y* − 4.

∴1 —- (2*x* − 3*y* − 4) = 1 —-2x + 3y + 4
= 5 —- 2x + 3y

∴ 1 exceeds 2*x* − 3*y* − 4 by 5 —- 2x + 3y.

Page No 146:

ANSWER:

(b) $-4x^3 + 5x^2 - 7x - 6$
In order to find what must be added, we subtract $(5x^3 - 2x^2 + 6x + 7)$ from $(x^3 + 3x^2 - x + 1)$.

$(x^3 + 3x^2 - x + 1) - (5x^3 - 2x^2 + 6x + 7)$
or, $x^3 + 3x^2 - x + 1 - 5x^3 + 2x^2 - 6x - 7$
or, $x^3 - 5x^3 + 3x^2 + 2x^2 - x - 6x + 1 - 7$
or, $-4x^3 + 5x^2 - 7x - 6$

Page No 146:

ANSWER:

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(a) $5x - 4y$

$2x - [3y - \{2x - (y - x)\}]$
= 2x − [3y − {2x − y + x}]
= 2x − [3y − {3x − y}]
= 2x − [3y − 3x + y]
= 2x − [4y − 3x]
= 2x − 4y + 3x
= 5x − 4y

Page No 146:

ANSWER:

(c) $-5yz$

All the terms in the expression $-5xyz$ barring x will be the coefficient of x, *i.e.* $-5yz$.

Page No 146:

ANSWER:

(b) trinomial
Since it contains three variables, i.e. 'x', 'y' and 'z', it is a trinomial.

Page No 146:

ANSWER:

(b) $x = 5$

$x5 = 1$or, $x5 \times 5 = 1 \times 5$ [Multiplying both the sides by 5]x5 = 1or, x5 × 5= 1 × 5 [Multip lying both the sides by 5]
or, x = 5

Page No 146:

ANSWER:

(c) 14
Substituting $x = 1$, $y = 2$ and $z = 3$ in $(x^2 + y^2 + z^2)$:
$(1)^2 + (2)^2 + (3)^2$12 + 22 + 32
or, 1 + 4 + 9 = 14

Aakash Institute

Page No 146:

ANSWER:

(c) 9

$\frac{1}{3}x + 5 = 8$13x + 5 = 8
or, $\frac{1}{3}x + 5 - 5 = 8 - 5$13x + 5 - 5 = 8-5 [Subtracting 5 from both the sides]
or, $\frac{1}{3}x = 3$13x = 3
or, $\frac{1}{3}x \times 3 = 3 \times 3$13x × 3 = 3×3 [Multiplying both the sides by 3]
or, x = 9

Page No 146:

ANSWER:

(i) monomial
(ii) binomial
(iii) trinomial
(iv) x = 3
3x −- 5 = 7 −- x
or, 3x + x = 7 + 5 [Transposing x to the L.H.S. and 5 to the R.H.S.]
or, 4x = 12
or, $\frac{4x}{4} = \frac{12}{4}$4x4 = 124
or, x = 3
(v) $2b^2$ −- $2a^2$
or, b^2 −- a^2 −- $a^2 + b^2$
or, $2b^2$ −- $2a^2$
$(b^2 - a^2) - (a^2 - b^2)$
$(b^2 - a^2) - (a^2 - b^2$
$(b^2 - a^2) - (a^2 - b^2)$
$(b^2 - a^2) - (a^2 - b^2)$

Page No 147:

ANSWER:

Aakash Institute

(i) True
Since it has one term, it is a monomial.

(ii) False
$2x + 5 = 8$
or, $2x + 5 - 5 = 8 - 5$ [Subtracting 5 from both the sides]
or, $2x = 3$
or, $x = 3/2$ and not $x = 2/3$

(iii) True
This is because the maximum power of the variable x is 1.

(iv) False
The coefficient of x in $5xy$ would be $5y$.

(v) True
$8 - x = 5$
or, $8 - 5 = x$
or, $3 = x$

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