1. Vedic Mathematics

Exercise 1.3

1. Question

Find the square root by Vedic methods.

2116

Answer

So finding the square root by Vedic method,

∵ four digits are in the number, so the digits in it's square root will be 2.

	46
4	21 16
+	- 16
4	516
86	- 516
	0

∴ the quotient is 46, so the square root is 46.

Hint –

I. Four digits in the number so two digits in the square root.

II. First square root digit = 4

III. 21 - 4^2 = 5 = Remainder

IV. Pair of digits 16 was descended before 5. So new dividend = 516.

V. Divisor = 4 × 2 = 8, i.e., double of square root digit.

VI. 86 divides 516 by 6, so write 6 ahead digit 4 in the quotient.

VII. 516 – 86 × 6 = 516 – 516 = 0

Remainder = 0, Square Root = Quotient = 46.

2. Question

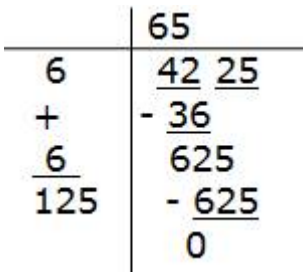
Find the square root by Vedic methods.

4225

Answer

So finding the square root by vedic method,

∵ four digits are in the number, so the digits in it's square root will be 2.



∴ the quotient is 65, so the square root is 65.

Hint –

I. Four digits in the number so two digits in the square root.

II. First square root digit = 6

III. 42 - 6^2 = 6 = Remainder

IV. Pair of digits 25 was descended before 6. So new dividend = 625.

V. Divisor = 6 × 2 = 12, i.e., double of square root digit.

VI. 125 divides 625 by 5, so write 5 ahead digit 6 in the quotient.

VII. 625 – 125 × 5 = 625 – 625 = 0

Remainder = 0, Square Root = Quotient = 65.

3. Question

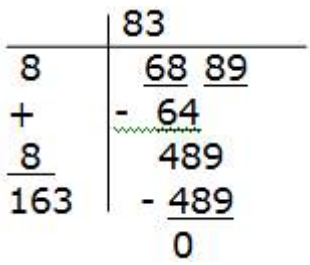
Find the square root by Vedic methods.

6889

Answer

So finding the square root by vedic method,

∵ four digits are in the number, so the digits in it's square root will be 2.



∴ the quotient is 83, so the square root is 83.

Hint –

I. Four digits in the number so two digits in the square root.

II. First square root digit = 4

III. 68 - 8^2 = 4 = Remainder

IV. Pair of digits 89 was descended before 4. So new dividend = 489.

V. Divisor = 8 × 2 = 16, i.e., double of square root digit.

VI. 163 divides 489 by 3, so write 3 ahead digit 8 in the quotient.

VII. 489 – 163 × 3 = 489 – 489 = 0

Remainder = 0, Square Root = Quotient = 83.

4. Question

Find the square root by Vedic methods.

59049

Answer

So finding the square root by Vedic method,

∵ five digits are in the number, so the digits in it's square root will be 3.

	243
2	5 90 49
+	-4
2	190
44	-176
+	1449
4	-1449
483	0

∴ the quotient is 243, so the square root is 24.

Hint –

I. Five digits in the number so three digits in the square root.

II. First square root digit = 2

III. 5 - 2^2 = 1 = Remainder

IV. Pair of digits 90 was descended before 1. So new dividend = 190.

V. Pair of digits 49 was descended before 14. So new dividend = 1449.

VI. Divisor = $2 \times 2 = 4$ & $44 + 4 = 48$ i.e., double of square root digit respectively.

VII. 483 divides 1449 by 3, so write 3 ahead digit 24 in the quotient.

VIII. $1449 - 483 \times 3 = 1449 - 1449 = 0$

Remainder = 0, Square Root = Quotient = 243.

5. Question

Find the square root by Vedic methods.

125316

Answer

So finding the square root by Vedic method,

∵ six digits are in the number, so the digits in its square root will be 3.

	354
3	12 53 16
+	-9
3	353
65	-325
+	2816
5	-2816
704	0

∴ the quotient is 354, so the square root is 354.

Hint –

I. Six digits in the number so three digits in the square root.

II. First square root digit = 3

III. $12 - 3^2 = 3$ = Remainder

IV. Pair of digits 53 was descended before 3. So new dividend = 353.

V. Pair of digits 16 was descended before 28. So new dividend = 2816.

VI. Divisor = $3 \times 2 = 6$ & $65 + 5 = 70$ i.e., double of square root digit respectively.

VII. 704 divides 2816 by 4, so write 4 ahead digit 35 in the quotient.

VIII. $2816 - 704 \times 4 = 2816 - 2816 = 0$

6. Question

Find the square root by Vedic methods.

169744

Answer

So finding the square root by Vedic method,

∵ six digits are in the number, so the digits in it's square root will be 3.

	412
4	16 97 44
+	-16
4	097
81	-81
+	1644
1	-1644
822	0

∴ the quotient is 412, so the square root is 412.

Hint –

I. Six digits in the number so three digits in the square root.

II. First square root digit = 4

III. 16 - 4^2 = 0 = Remainder

IV. Pair of digits 97 was descended before 0. So new dividend = 97.

V. Pair of digits 44 was descended before 16. So new dividend = 1644.

VI. Divisor = 4 × 2 = 8 & 81 + 1 = 82 i.e., double of square root digit respectively.

VII. 822 divides 1644 by 2, so write 2 ahead digit 41 in the quotient.

VIII. 1644 – 822 × 2 = 1644 – 1644 = 0

7. Question

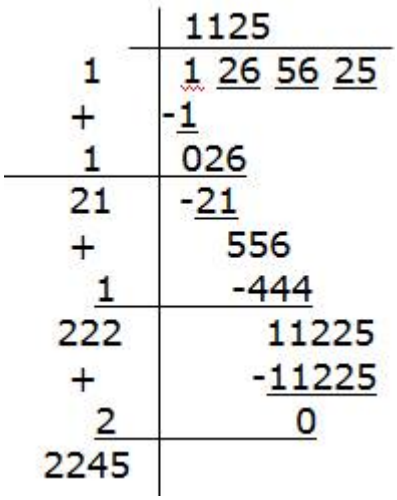
Find the square root by Vedic methods.

1265625

Answer

So finding the square root by Vedic method,

∵ seven digits are in the number, so the digits in it's square root will be 3.



∴ the quotient is 1125, so the square root is 1125.

Hint –

I. Seven digits in the number so four digits in the square root.

II. First square root digit = 1

III. $1 - 1^2 = 0$ = Remainder

IV. Pair of digits 26 was descended before 0. So new dividend = 26.

V. Pair of digits 56 was descended before 5. So new dividend = 556.

VI. Pair of digits 112 was descended before 25. So new dividend = 11225.

VII. Divisor = $1 \times 1 = 1$ & $222 + 2 = 224$ i.e., double of square root digit respectively.

VIII. 2245 divides 11225 by 5, so write 5 ahead digit 112 in the quotient.

IX. $11225 - 2245 \times 5 = 11225 - 11225 = 0$

8. Question

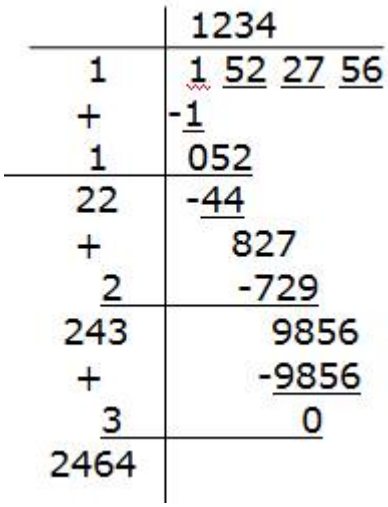
Find the square root by Vedic methods.

1522756

Answer

So finding the square root by Vedic method,

∵ seven digits are in the number, so the digits in it's square root will be 3.



∴ the quotient is 1234, so the square root is 1234.

Hint –

I. Seven digits in the number so four digits in the square root.

II. First square root digit = 1

III. $1 - 1^2 = 0$ = Remainder

IV. Pair of digits 52 was descended before 0. So new dividend = 52.

V. Pair of digits 27 was descended before 8. So new dividend = 827.

VI. Pair of digits 56 was descended before 98. So new dividend = 9856.

VII. Divisor = $1 \times 1 = 1$ & $243 + 3 = 246$ i.e., double of square root digit respectively.

VIII. 2464 divides 9856 by 4, so write 4 ahead digit 123 in the quotient.

IX. $9856 - 2464 \times 4 = 9856 - 9856 = 0$

9. Question

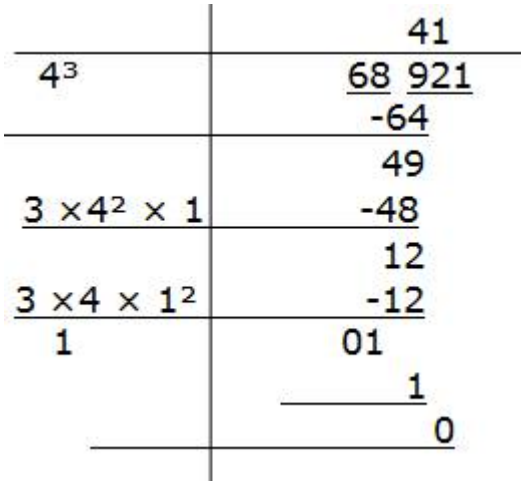
Find the cube root of the perfect cube number by Vedic methods.

68921

Answer

So finding the cube root by Vedic method,

∵ five digits are in the number, so the digits in its cube root will be 2.



∴ the quotient is 41, so the cube root is 41.

I. 68 - 8^2 = 4

II. New dividend = 49.

III. Divide the new dividend by 3 × 4^2 = 48

IV. Write above quotient digit = 1. Subtract 3 × 4^2 × 1. Remainder = 12. New Dividend = 12.

V. Subtract 3 × 4 × 1^2 = 864. Subtract 12 and the remainder is 12.

VI. Again new dividend = 1^3 = 1.

VII. New dividend = 1 - 1^3 = 0

VIII. Therefore cube root = 41.

10. Question

Find the cube root of the perfect cube number by Vedic methods.

636056

Answer

So finding the cube root by Vedic method,

∵ six digits are in the number, so the digits in its cube root will be 2.

	86
8^3	636 056
	-512
	1240
$3 \times 8^2 \times 6$	-1152
	885
$3 \times 8 \times 6^2$	-864
6^3	216
	-216
	0

∴ the quotient is 86, so the cube root is 86.

I. 636 - 8^3 = 124

II. New dividend = 1240.

III. Divide the new dividend by 3×8^2 = 192

IV. Write above quotient digit = 6. Subtract $3 \times 8^2 \times 6$. Remainder = 88. New Dividend = 885.

V. Subtract $3 \times 8 \times 6^2$ = 864. Subtract 864 and the remainder is 21.

VI. Again new dividend = 6^3 = 216.

VII. New dividend = 216 - 6^3 = 0

VIII. Therefore cube root = 86.

11. Question

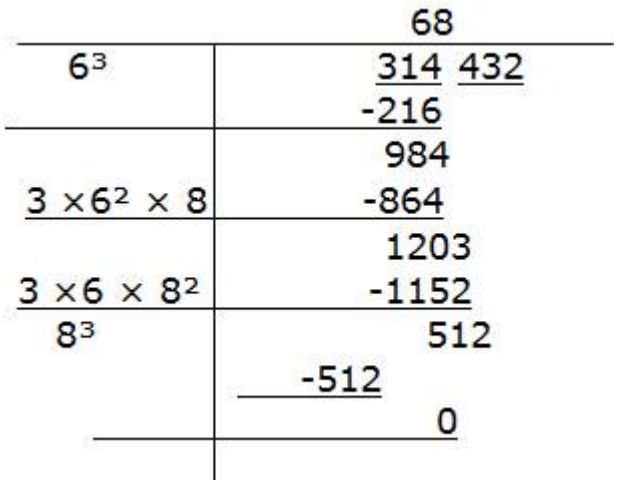
Find the cube root of the perfect cube number by Vedic methods.

314432

Answer

So finding the cube root by Vedic method,

∵ six digits are in the number, so the digits in its cube root will be 2



∴ the quotient is 68, so the cube root is 68.

I. 314 - 6^3 = 98

II. New dividend = 984.

III. Divide the new dividend by 3×6^2 = 108

IV. Write above quotient digit = 8. Subtract $3 \times 6^2 \times 8$. Remainder = 120. New Dividend = 1203.

V. Subtract $3 \times 6 \times 8^2$ = 1152. Subtract 1152 and the remainder is 51.

VI. Again new dividend = 8^3 = 512.

VII. New dividend = 512 - 8^3 = 0

VIII. Therefore cube root = 68.

12. Question

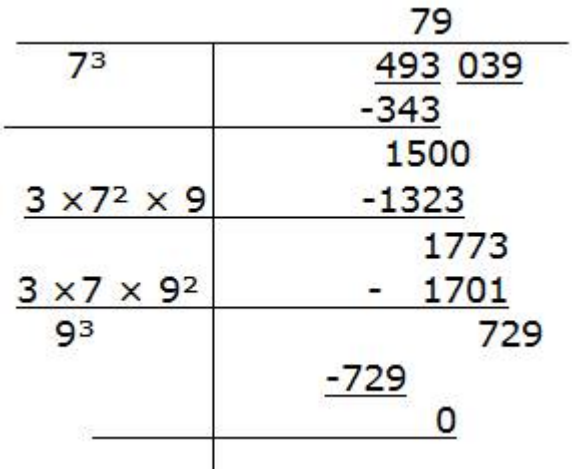
Find the cube root of the perfect cube number by Vedic methods.

493039

Answer

So finding the cube root by Vedic method,

∵ three digits are in the number, so the digits in its cube root will be 2



∴ the quotient is 79, so the cube root is 79.

I. 493 - 7^3 = 15

II. New dividend = 1500.

III. Divide the new dividend by 3×7^2 = 147

IV. Write above quotient digit = 7. Subtract $3 \times 7^2 \times 9$. Remainder = 177. New Dividend = 1773.

V. Subtract $3 \times 7 \times 9^2$ = 1701. Subtract 1701 and the remainder is 72.

VI. Again new dividend = 9^3 = 729.

VII. New dividend = 729 - 9^3 = 0

VIII. Therefore cube root = 79.

13. Question

Find the cube root of the perfect cube number by Vedic methods.

8365427

Answer

So finding the cube root by Vedic method,

∵ seven digits are in the number, so the digits in its cube root will be 3.

	203
2^3	8 365 427
	-8
	03
$3 \times 2^2 \times 0$	-00
	36
$3 \times 2 \times 0^2$	-00
0^3	365
	-000
	3654
$3 \times 20^2 \times 3$	-3600
$3 \times 20 \times 3^2$	542
	-540
3^3	27
	-27
	0

∴ the quotient is 203, so the cube root is 203.

I. $8 - 2^3 = 0$

II. New dividend = 36.

III. Divide the new dividend by $3 \times 2^2 = 12$

IV. Write above quotient digit = 0. Subtract $3 \times 2^2 \times 0$. Remainder = 3. New Dividend = 36.

V. Subtract $3 \times 2 \times 0^2 = 0$. Subtract 0 and the remainder is 36.

VI. Again new dividend = $3^3 = 27$.

VII. New dividend = $27 - 3^3 = 0$

VIII. Therefore cube root = 203.

14. Question

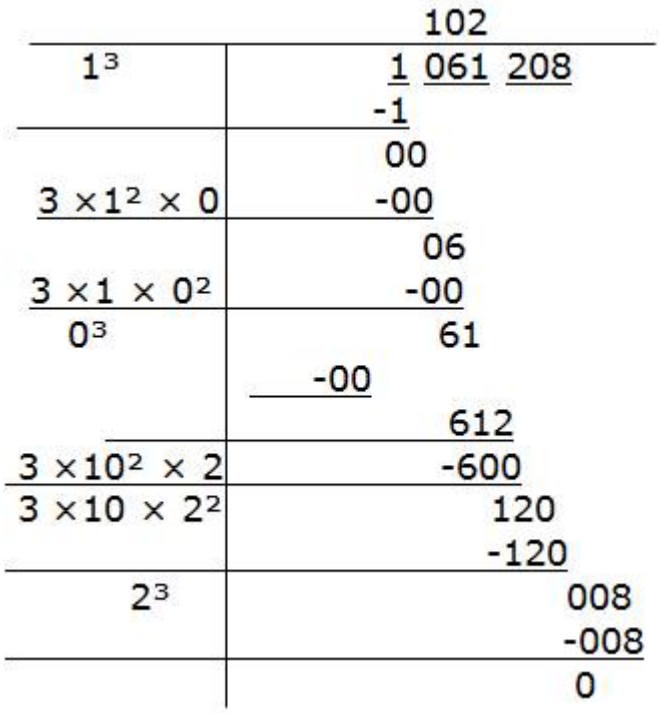
Find the cube root of the perfect cube number by Vedic methods.

1061208

Answer

So finding the cube root by Vedic method,

∵ seven digits are in the number, so the digits in its cube root will be 3.



∴ the quotient is 102, so the cube root is 102.

I. $1 - 1^3 = 0$

II. New dividend = 00.

III. Divide the new dividend by $3 \times 1^2 = 3$

IV. Write above quotient digit = 1. Subtract $3 \times 1^2 \times 0$. Remainder = 0. New Dividend = 6.

V. Subtract $3 \times 1 \times 0^2 = 0$. Subtract 0 and the remainder is 6.

VI. Again new dividend = $2^3 = 8$

VII. New dividend = $512 - 8^3 = 0$

VIII. Therefore cube root = 102.

15. Question

Find the cube root of the perfect cube number by Vedic methods.

8489664

Answer

So finding the cube root by Vedic method,

∵ seven digits are in the number, so the digits in its cube root will be 3.

	204
2^3	8 489 664
	-8
	04
$3 \times 2^2 \times 0$	-00
	48
$3 \times 2 \times 0^2$	-00
0^3	489
	-000
	4896
$3 \times 20^2 \times 4$	-4800
$3 \times 20 \times 4^2$	966
	-960
4^3	64
	-64
	0

∴ the quotient is 204, so the cube root is 204.

I. $8 - 2^3 = 0$

II. New dividend = 4.

III. Divide the new dividend by $3 \times 2^2 = 12$

IV. Write above quotient digit = 2. Subtract $3 \times 2^2 \times 0$. Remainder = 4. New Dividend = 48.

V. Subtract $3 \times 2 \times 0^2 = 0$. Subtract 0 and the remainder is 48.

VI. Again new dividend = $4^3 = 64$.

VII. New dividend = $64 - 4^3 = 0$

VIII. Therefore cube root = 204.

16. Question

Find the cube root of the perfect cube number by Vedic methods.

200201625

Answer

So finding the cube root by Vedic method,

∵ nine digits are in the number, so the digits in its cube root will be 3.

	585
5^3	200 201 625 -125
$3 \times 5^2 \times 8$	0752 -0600
$3 \times 5 \times 8^2$	1520 - 960
8^3	5601 -512
$3 \times 58^2 \times 5$	50896 -50460
$3 \times 58 \times 5^2$	4362 -4350
5^3	125 -125
	0

∴ the quotient is 585 so the cube root is 585.

I. 200 - 5^3 = 75

II. New dividend = 752.

III. Divide the new dividend by 3×5^2 = 75

IV. Write above quotient digit = 5. Subtract $3 \times 5^2 \times 8$. Remainder = 152. New Dividend = 1520.

V. Subtract $3 \times 5 \times 8^2$ = 960. Subtract 560 and the remainder is 5601.

VI. Again new dividend = 5^3 = 125.

VII. New dividend = 125 - 5^3 = 0

VIII. Therefore cube root = 585.

17. Question

Find the cube root of the perfect cube number by Vedic methods.

258474853

Answer

So finding the cube root by Vedic method,

∵ nine digits are in the number, so the digits in its cube root will be 3.

	637
6^3	258 474 853
	-216
	0424
$3 \times 6^2 \times 3$	-0324
	1007
$3 \times 6 \times 3^2$	-162
3^3	8454
	-27
	84278
$3 \times 63^2 \times 7$	-83349
$3 \times 63 \times 7^2$	9295
	-9261
7^3	343
	-343
	0

∴ the quotient is 637 so the cube root is 637.

I. 258 - 6^3 = 42

II. New dividend = 424.

III. Divide the new dividend by 3 $\times$ 6^2 = 108

IV. Write above quotient digit = 6. Subtract 3 $\times$ 6^2 $\times$ 3. Remainder = 100. New Dividend = 1007.

V. Subtract 3 $\times$ 6 $\times$ 3^2 = 162. Subtract 162 and the remainder is 845.

VI. Again new dividend = 7^3 = 343.

VII. New dividend = 343 - 7^3 = 0

VIII. Therefore cube root = 637.

18. Question

Find the cube root of the perfect cube number by Vedic methods.

22665187

Answer

So finding the cube root by Vedic method,

∵ eight digits are in the number, so the digits in its cube root will be 3.

	283
2^3	22 665 187
	- 8
	146
$3 \times 2^2 \times 8$	- 96
	506
$3 \times 2 \times 8^2$	- 384
8^3	1225
	-512
	7131
$3 \times 28^2 \times 3$	-7056
$3 \times 28 \times 3^2$	758
	-756
3^3	27
	-27
	0

∴ the quotient is 283 so the cube root is 283.

I. 22 - 2^3 = 14

II. New dividend = 146.

III. Divide the new dividend by 3 × 2^2 = 12

IV. Write above quotient digit = 2. Subtract 3 × 2^2 × 8. Remainder =50. New Dividend = 506.

V. Subtract 3 × 2 × 8^2 = 384. Subtract 384 and the remainder is 122.

VI. Again new dividend = 3^3 = 27.

VII. New dividend = 27 - 3^3 = 0

VIII. Therefore cube root = 283.

19. Question

Find the cube root of the perfect cube number by Vedic methods.

8615125

Answer

So finding the cube root by Vedic method,

∵ seven digits are in the number, so the digits in its cube root will be 3.

	205
2^3	8 615 125
	-8
	06
$3 \times 2^2 \times 0$	-00
	61
$3 \times 2 \times 0^2$	-00
0^3	615
	- 00
	6151
$3 \times 20^2 \times 5$	-6000
$3 \times 20 \times 5^2$	1512
	-1500
5^3	125
	-125
	0

∴ the quotient is 205 so the cube root is 205.

I. $8 - 2^3 = 0$

II. New dividend = 6.

III. Divide the new dividend by $3 \times 2^2 = 12$

IV. Write above quotient digit = 2. Subtract $3 \times 2^2 \times 0$. Remainder = 0. New Dividend = 615.

V. Subtract $3 \times 2 \times 0^2 = 0$. Subtract 0 and the remainder is 615.

VI. Again new dividend = $5^3 = 125$.

VII. New dividend = $125 - 5^3 = 0$

VIII. Therefore cube root = 205.

20. Question

Find the cube root of the perfect cube number by Vedic methods.

660776311

Answer

So finding the cube root by Vedic method,

∵ nine digits are in the number, so the digits in its cube root will be 3.

	871
8^3	660 776 311
	-512
	1487
$3 \times 8^2 \times 7$	-1344
	1437
$3 \times 8 \times 7^2$	- 1176
7^3	2616
	-343
	22733
$3 \times 87^2 \times 1$	-22707
$3 \times 87 \times 1^2$	261
	-261
1^3	0001
	-0001
	0

∴ the quotient is 871 so the cube root is 871.

I. 660 - 8^3 = 148

II. New dividend = 1487.

III. Divide the new dividend by $3 \times 8^2 = 72$

IV. Write above quotient digit = 8. Subtract $3 \times 8^2 \times 7$. Remainder = 143. New Dividend = 1437.

V. Subtract $3 \times 8 \times 7^2 = 1176$. Subtract 1176 and the remainder is 261.

VI. Again new dividend = $1^3 = 1$.

VII. New dividend = 1 - $1^3 = 0$

VIII. Therefore cube root = 871.

Exercise 1.4

1. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

13 x – 14 = 9x + 10

Answer

As per the formula of Parvartya Yojayet, its application is used as –

∵ ax + b = cx + d

$$\therefore x = \frac{d - b}{a - c}$$

So comparing the equations,

a = 13, b = -14, c = 9 & d = 10

$$\therefore x = \frac{10-(-14)}{13-9} = \frac{24}{4}$$

$\therefore$ x = 6

2. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

3y + 4 = 5y – 4

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$\because$ ax + b = cx + d

$$\therefore x = \frac{d-b}{a-c}$$

So comparing the equations,

a = 3, b = 4, c = 5 & d = -4

$$\therefore x = \frac{-4-4}{3-5} = -\frac{8}{-2}$$

$\therefore$ x = 4

3. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

$$\frac{2x+1}{3x+4} = \frac{1}{3}$$

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$$\because \frac{ax+b}{p} = \frac{cx+d}{q}$$

$$\therefore x = \frac{dp-bq}{aq-cp}$$

$$\frac{2x+1}{1} = \frac{3x+4}{3}$$

So comparing the equations,

a = 2, b = 1, c = 3, d = 4, p = 1 & q = 3

$$\therefore x = \frac{4(1) - 1(3)}{2(3) - 3(1)} = \frac{1}{3}$$

$$\therefore x = \frac{1}{3}$$

4. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

$$\frac{5x - 3}{2} = \frac{2x + 1}{5}$$

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$$\because \frac{ax + b}{p} = \frac{cx + d}{q}$$

$$\therefore x = \frac{dp - bq}{aq - cp}$$

So comparing the equations,

a=5, b=-3, c=2, d=1, p=2 & q=5

$$\therefore \mathbf{x = \frac{1(2) - (-3)(5)}{5(5) - 2(2)} = \frac{17}{21}}$$

$$\therefore \mathbf{x = \frac{17}{21}}$$

5. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

(x + 7) (x + 9) = (x – 8) (x – 11)

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$\because$ (x + a) (x + b) = (x + c) (x + d)

$$\therefore \mathbf{x = \frac{cd - ab}{a + b - c - d}}$$

So comparing the equations,

a = 7, b = 9, c = -8 & d = -11

$$\therefore \mathbf{x} = \frac{(-8)(-11) - (7)(9)}{7 + 9 - (-8) - (-11)} = \frac{25}{35}$$

$$\therefore \mathbf{x} = \frac{5}{7}$$

6. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

(x + 5) (x + 1) = (x + 3) (x + 2)

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$\because$ (x + a) (x + b) = (x + c) (x + d)

$$\therefore \mathbf{x} = \frac{\mathbf{cd - ab}}{\mathbf{a + b - c - d}}$$

So comparing the equations,

a=5, b=1, c=3 & d=2

$$\therefore \mathbf{x} = \frac{(3)(2) - (5)(1)}{5 + 1 - (3) - (2)} = \frac{1}{1}$$

$\therefore$ x = 1

7. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

$$\frac{1}{x+1} - \frac{2}{x-1} = 0$$

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$$\because \frac{m}{x+a} + \frac{n}{x+b} = 0$$

$$\therefore x = -\frac{mb + na}{m + n}$$

So comparing the equations,

a = 1, b = -1, m = 1 & n = -2

$$\therefore x = -\frac{(1)(-1)+(-2)(1)}{1-2} = -(\frac{-3}{-1})$$

$\therefore x = -3$

8. Question

Find the oral solution of the equation by the formula paravartya Yojayet.

$$\frac{5}{2x-1} - \frac{9}{3x-2} = 0$$

Answer

As per the formula of Parvartya Yojayet, its application is used as –

$$\because \frac{m}{x+a} + \frac{n}{x+b} = 0$$

Dividing the part and second part of the equation by 2 & 3 respectively.

$$\frac{2.5}{x-0.5} - \frac{3}{x-\left(\frac{2}{3}\right)} = 0$$

$$\therefore x = -\frac{mb+na}{m+n}$$

So comparing the equations,

$a = -\frac{1}{2}, b = -\frac{2}{3}$, m = 2.5 & n = -3

$$\therefore x = -\frac{(2.5)(-2/3)+(-3)(-1/2)}{2.5-3} = -(-\frac{1}{-3})$$

$$\therefore x = -\frac{1}{3}$$

9. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

(2x + 1) + (x + 3) = 5x + 4

Answer

As per the formula of Sunyam Samaysamuchchaye, its second application is used –

If the independent terms of both the sides of the equation are equal, then the value of variable quantity is zero.

$\because$ the value of independent term is 4.

$\therefore x = 0$

10. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$a(x - 1) + b(x - 1) = c(x - 1) + d(x - 1)$

Answer

As per the formula of Sunyam Samaysamuchchaye, its second application is used –

If the independent terms of both the sides of the equation are equal, then the value of variable quantity is zero.

$\therefore x - 1 = 0$

$\therefore x = 1$

11. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$(x + 1)(x + 9) = (x + 3)(x + 3)$

Answer

As per the formula of Sunyam Samaysamuchchaye, its second application is used –

If the independent terms of both the sides of the equation are equal, then the value of variable quantity is zero.

$\because$ the value of independent term is 4.

$\therefore x = 0$

12. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{x}{2} + \frac{x}{3} = \frac{x}{4} + \frac{x}{1}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its first application is used –

If in each term'x' is the common factor, then the value of ;x' is zero.

$\because$ the value of independent term is 4.

$\therefore x = 0$

13. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{1}{x+4}+\frac{1}{x-6}=0$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its third application is used –

If the numerators of two fractions in the equation are equal i.e., 1.

$$\because \frac{1}{x+a}+\frac{1}{x+b}=0$$

$$\therefore x=-\frac{a+b}{2}$$

So comparing the equations,

a = 4 & b = -6

$$\therefore x=-\frac{4+(-6)}{2}=-(-1)$$

$\therefore x = 1$

14. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{5}{3x+2}+\frac{5}{2x+8}=0$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its third application is used –

If the numerators of two fractions in the equation are equal i.e., 5.

$$\because \frac{m}{x+a}+\frac{m}{x+b}=0$$

$\therefore x + a + x + b = 0$

So adding the denominators,

$3x + 2 + 2x + 8 = 0$

5x = -10

∴ x = -2

15. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{2x+4}{2x+1}=\frac{2x+1}{2x+4}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its fourth application is used –

If the sum of the numerators & the sum of the denominators of the equation are mutually equal.

So adding the denominators,

2x + 4 + 2x + 1 = 0

4x = -5

$$\therefore x=-\frac{5}{4}$$

16. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{3x+2}{5x+7}=\frac{x+1}{3x+5}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its fourth application is used –

The question given is incorrect as the correct question is $\frac{3x+2}{5x+7}=\frac{x+1}{3x-1}$, (GIVEN IN REFERNEC MATERIAL)

If the sum of the numerators & the sum of the denominators of the equation are mutually equal.

So adding the denominators,

3x + 2 + x + 1 = 0 5x + 7 + 3x – 1 = 0

4x + 3 = 0 8x + 6 = 0

$\therefore x = -\frac{3}{4}$

17. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{5x+7}{2x+1} = \frac{x+1}{3x+5}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its fifth application is used –

If the difference of the numerators & denominators of both the part of the equation are equal.

So adding the denominators,

5x + 7 - 2x - 1 x + 1 - 3x - 5

3x + 6 -2x - 4

Equating both the equations to zero,

3x + 6 = 0 -2x – 4 = 0

∴x = -2 x = -2

18. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{3x+6}{6x+3} = \frac{5x+4}{2x+7}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its fifth application is used –

If the difference of the numerators & denominators of both the part of the equation are equal.

So adding the denominators,

3x + 6 - 6x - 3 5x + 4 - 2x - 7

-3x + 3 3x - 3

Equating both the equations to zero,

$\therefore x = -\frac{5}{4}$ x = 1

19. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{1}{x+2}+\frac{1}{x+6}=\frac{1}{x+1}+\frac{1}{x+7}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its sixth application is used –

If there are two terms in each side of an equation and each of the numerators of the terms are mutually equal and the sum of denominators on the left side is equal to the sum of denominators on the right side, then putting this sum equal to zero, the value of variable quantity is obtained.

So adding the denominators on LHS & RHS,

x + 2 + x + 6 x + 1 + x + 7

2x + 8 2x + 8

$\because$ 2x + 8 = 0

$\therefore$ x = -4

20. Question

Solve the equation by formula Sunyam Samyasamuchchaye.

$$\frac{1}{x-4}+\frac{1}{x-6}=\frac{1}{x-2}+\frac{1}{x-8}$$

Answer

As per the formula of Sunyam Samaysamuchchaye, its sixth application is used –

If there are two terms in each side of an equation and each of the numerators of the terms are mutually equal and the sum of denominators on the left side is equal to the sum of denominators on the right side, then putting this sum equal to zero, the value of variable quantity is obtained.

So adding the denominators on LHS & RHS,

x – 4 + x - 6 x – 2 + x - 8

2x - 10 2x - 10

$\because 2x - 10 = 0$

$\therefore x = 5$