CBSE Board
Class VIII Mathematics
Term II
Sample Paper 2

Time: 2 ½ hours | Total Marks: 80

General Instructions:

1. **All** questions are **compulsory**.
2. **Section A** comprises of **12** questions carrying 1 mark each.
3. **Section B** comprises of **12** questions carrying 2 marks each.
4. **Section C** comprises of **8** questions carrying 3 marks each.
5. **Section D** comprises of **5** questions carrying 4 marks each.

Section A
(Questions 1 to 12 carry 1 mark each)

1. The expression $(t^2 + 3)(t + \sqrt{3})(t - \sqrt{3})$ can be written as

A. $t^4 + 3$
B. $t^4 - 3$
C. $t^4 + 9$
D. $t^4 - 9$

2. Count the vertices in the following shape:

A. 4
B. 5
C. 6
D. 3

3. If the cost of painting 1 m^2 of wooden board is Rs. 5, then the cost of painting a wooden rectangular prism of sides 4 m, 3 m, and 5 m is:

A. Rs. 300
B. Rs. 340
C. Rs. 470
D. Rs. 530

4. The sum of two numbers is 80 and their ratio is 3 : 5. Find the greatest amongst the two numbers.

A. 20
B. 30
C. 40
D. 50

5. The exponential expression $\left\{\left(\frac{1}{5}\right)^{-2} - \left(\frac{1}{4}\right)^{-3}\right\} \times \left(\frac{-1}{2}\right)^{-4}$ is equal to

A. -624
B. 624
C. 642
D. -264

6.

x	3	6
y	4	a

If x and y are inversely proportional then find the value of a.

A. 4
B. 1
C. 3
D. 2

7. By joining the points (0, 0), (1, 1), (2, 2) and (3, 3) we get

A. A curved line
B. A straight line
C. A parallelogram
D. A square

8. The rational number whose reciprocal is not a rational number is _____.

A. 1
B. -1
C. $-\frac{1}{5}$
D. 0

9. Which of the following is a polyhedron?

A. Cylinder
B. Cone
C. Cuboid
D. Sphere

10. Which natural number is equal to its cube?

A. 1
B. 2
C. 3
D. 4

11. If S.P. = Rs. 380 and sales tax is 4%, then the amount of sales tax is given by

A. Rs. 15.40
B. Rs. 15.60
C. Rs. 15.30
D. Rs. 15.20

12. The equation $\frac{4}{x-1}=\frac{3}{x+7}$ can also be written as _____.

A. x + 30 = 0
B. x - 31 = 0
C. x + 31 = 0
D. x - 30 = 0

Section B

(Questions 13 to 24 carry 2 marks each)

13. Express the following product as monomial:

$(a^{50}b^{51})(b^{49}c^{67})(c^{33}d)(c^{99}a^{50})$

14. Find the square of the number 82 using the property $(a + b)^2 = a^2 + b^2 + 2ab$

15. Write the following numbers in usual form:

i) $100 \times 7 + 10 \times 9 + 1 \times 8$
ii) $1000 \times 3 + 100 \times 1 + 10 \times 5 + 1 \times 9$

16. The perimeter of the floor of a room is 50 m and its height is 2.5 m. Find the area of four walls of the room.

17. Factorise $3x^2 + 7x + 14 + 6x$

18. If 26% of a number is 65, then find the number.

19. In the following addition, find A.

$$\begin{array}{r} 31A \\ +\,1A3 \\ \hline 501 \end{array}$$

20. Convert the following into power notation:

i) $\frac{1}{27}$

ii) $\frac{-1}{32}$

21. Which of the following numbers are divisible by 4?

(i) 45748

(ii) 21404

22. Can a polyhedron have 10 faces, 20 edges and 15 vertices?

23. The distance between Sun and Saturn is 1,433,500,000,000 m. Express this distance in standard form.

24. Construct a rectangle whose adjacent sides are 6 cm and 4.2 cm.

Section C

(Questions 25 to 32 carry 3 marks each)

25. A village has a population of 5000. It requires 120 liters of water per head per day. It has a tank measuring 20 m by 20 m by 3 m. For how many days the water of this tank will last?

26. Quantities u and v vary directly and when u = 12 and v = 16. Which of the following is not a possible pair of corresponding values of u and v?

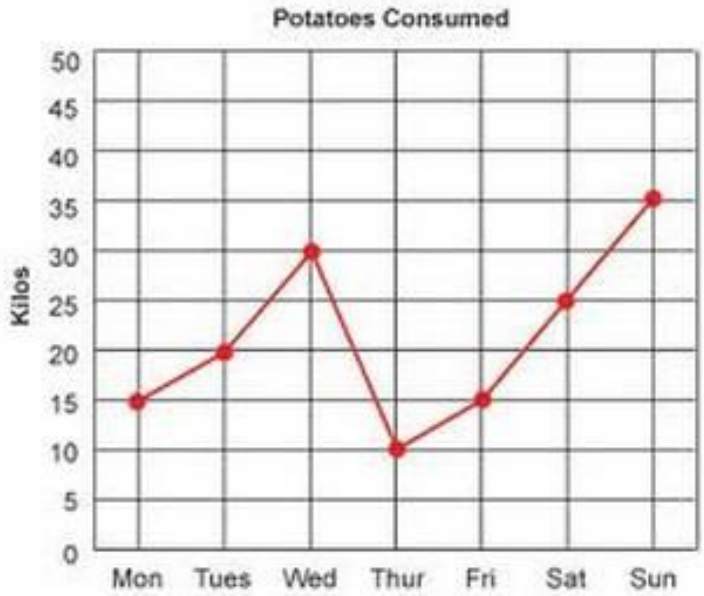
(i) 6 and 8

(ii) 15 and 20

(iii) 18 and 22.

27. What will be the value of a, if y + 2 is a factor of $4y^4 + 2y^3 - 3y^2 + 8y + 5a$.

28. The following graph shows the amount of potatoes consumed in kg.



Read the graph and answer the following questions.

a. On which day did maximum amount of potatoes consumed?
b. On which day the consumption of potatoes went down?
c. What is the combine consumption of potatoes on Monday, Tuesday and Wednesday?

29. The edge of a cube is 2 cm. Find the total surface area of the cuboid formed by three such cubes joined edge to edge.

30. The smallest side of a triangle is 5 cm less than one-third of the biggest side. The smallest side is also 3 cm less than half of the third side. If the perimeter of the triangle is 39 cm, then find the three sides of the triangle.

31. Find the Pythagorean triplet whose smallest member is 10.

32. Represent $\frac{2}{5}$ on the number line.

Section D

(Questions 33 to 37 carry 4 marks each)

33. A bank gives 10% simple interest on the deposits. Draw a graph to show the relation between the sum deposited and the simple interest earned.

34.

i) Define prisms and draw a rough diagram of a triangular prism. Also, verify the Euler's formula for the same.

ii) Define cylinder. Draw its rough diagram and write the number of faces and edges of it.

35. A rectangular park is 38 m long and 15 m wide. A path 3.5 m wide is constructed outside the park. Find the perimeter of the path.

36. Write the following numbers in expanded form.

i) 548
ii) 6985
iii) 85
iv) 356

37. Solve for x:

i) $\frac{x+0.25}{3}-x=0.5$

ii) $\frac{(5x+1)}{12}-2=\frac{(3x-1)}{9}$

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Sample Paper 2 – Solution

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Section A

1. Correct answer: D

$(t^2 + 3)(t + \sqrt{3})(t - \sqrt{3}) = (t^2 + 3)[t^2 - (\sqrt{3})^2]$

$= (t^2 + 3)(t^2 - 3)$

$= (t^2)^2 - (3)^2$

$= t^4 - 9$

$[(x - y)(x + y) = x^2 - y^2]$

2. Correct answer: C

The given shape has 6 vertices.

3. Correct answer: C

Surface area of the rectangular prism $= 2(lb + bh + hl)$

$= 2(4 \times 3 + 3 \times 5 + 5 \times 4)$

$= 2(12 + 15 + 20) = 2 \times 47 = 94\ m^2$

$\therefore$ Cost of painting wooden block of surface area $94\ m^2$ = Rs 5×94 = Rs 470

4. Correct answer: D

Let one number be x and the other number be (80 – x).

From the given information, we have

$$\frac{x}{80-x} = \frac{3}{5}$$

$$\Rightarrow 5x = 240 - 3x$$

$$\Rightarrow 5x + 3x = 240$$

$$\Rightarrow 8x = 240$$

$$\Rightarrow x = \frac{240}{8} = 30$$

Thus, the two numbers are 30 and (80 – 30) = 50.

Hence, the greatest number amongst the two is 50.

5. Correct answer: A

$$\left\{\left(\frac{1}{5}\right)^{-2} - \left(\frac{1}{4}\right)^{-3}\right\} \times \left(\frac{-1}{2}\right)^{-4}$$

$= \{5^2\text{-}4^3\} \times (-2)^4$

$= \{25\text{-}64\} \times 16$

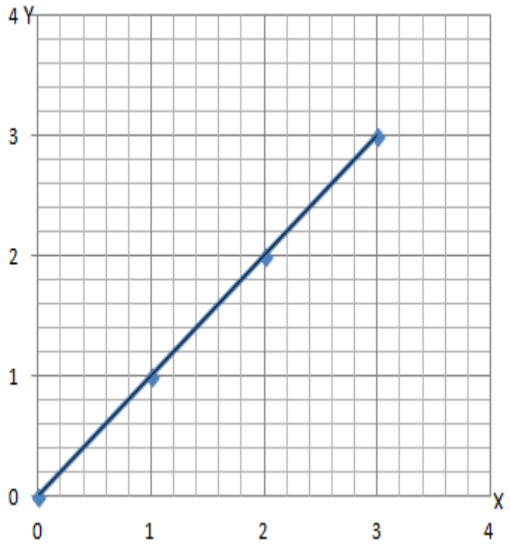
$= -39 \times 16$

$= -624$

Hence, the simplified value is -624.

6. Correct answer: D
Here, $6 \times a = 3 \times 4$
Therefore, $a = 2$.

7. Correct answer: B
A straight line



8. Correct answer : D

A rational number is a number of the form $\frac{p}{q}$ where $q \neq 0$. So in case of reciprocal of 0, denominator will be 0.

9. Correct answer: C
Cuboid is a polyhedron because its faces are congruent and regular polygons. Also, its vertices are formed by same number of faces.

10. Correct answer: A

$1^3 = 1$

Thus, the natural number 1 is equal to its cube.

11. Correct answer: D

$$\text{Sales tax} = \frac{4}{100} \times 380 = 15.20$$

12. Correct answer: C

$$\frac{4}{x-1} = \frac{3}{x+7}$$

On cross-multiplying, we get

$4x + 28 = 3x - 3$

$4x - 3x = -3 - 28$

$x = -31$

$x + 31 = 0$

Section B

13.

$$(a^{50}b^{51})(b^{49}c^{67})(c^{33}d)(c^{99}a^{50})$$

$$= (a^{50} \times a^{50})(b^{51} \times b^{49})(c^{67} \times c^{33} \times c^{99})(d)$$

$$= (a^{50+50})(b^{51+49})(c^{67+33+99})(d)$$

$$= a^{100}b^{100}c^{199}d$$

14. $82^2 = (80 + 2)^2$

In the property $(a + b)^2 = a^2 + b^2 + 2ab$, putting $a = 80$ and $b = 2$, we get

$(80 + 2)^2 = 80^2 + 2^2 + 2 \times 80 \times 2$

$= 6400 + 4 + 320$

$= 6724$

15.

(i) $100 \times 7 + 10 \times 9 + 1 \times 8 = 700 + 90 + 8 = 798$

(ii) $1000 \times 3 + 100 \times 1 + 10 \times 5 + 1 \times 9$

$= 3000 + 100 + 50 + 9$

$= 3159$

16.

Area of 4 walls is $= 2(bh + hl)$

$= 2(b + l)h$

$=$Perimeter $\times h$

$=50 \times 2.5$

$=125\ m^2$

Hence, the area of 4 walls is 125 m^2.

17. $3x^2 + 7x + 14 + 6x$

By regrouping of terms, we have

$\underline{3x^2 + 6x} + \underline{7x + 14}$

Taking out common factor from underlined terms, we get

$= 3x\underline{(x + 2)} + 7\underline{(x + 2)}$

Again, taking out the underlined common factor, we have

$= (x + 2)(3x + 7)$

18. Let the required number be x. Then,

26% of x = 65

$\Rightarrow \frac{26}{100}x = 65$

$\Rightarrow x = \left(65 \times \frac{100}{26}\right)$

$\Rightarrow x = 250$

Hence, the required number is 250.

19. Consider:

$$\begin{array}{r} 3\ 1\ A \\ +\ 1\ A\ 3 \\ \hline 5\ 0\ 1 \end{array}$$

At one's place, A + 3 = _1

So think of a number which when added to 3 gives one's place as 1.

Such a number is 8 as 8 + 3 = 11

Taking, A = 8, we obtain the addition as below:

$$\begin{array}{r} 3\ 1\ 8 \\ +\ 1\ 8\ 3 \\ \hline 5\ 0\ 1 \end{array}$$

20.

(i) $\frac{1}{27} = \frac{1}{3 \times 3 \times 3} = \frac{1}{3^3} = 3^{-3}$

(ii) $\frac{-1}{32} = \frac{-1}{2 \times 2 \times 2 \times 2 \times 2} = \frac{-1}{2^5} = \frac{(-1)^5}{2^5} = \left(\frac{-1}{2}\right)^5$

21. A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

(i) Consider 45748
Number formed by last two digits is 48.
Since, 48 is divisible by 4.
Hence, 45748 is also divisible by 4.

(ii) Consider 21404
Number formed by last two digits is 04.
Since, 04 is divisible by 4.
Hence, 21404 is also divisible by 4.

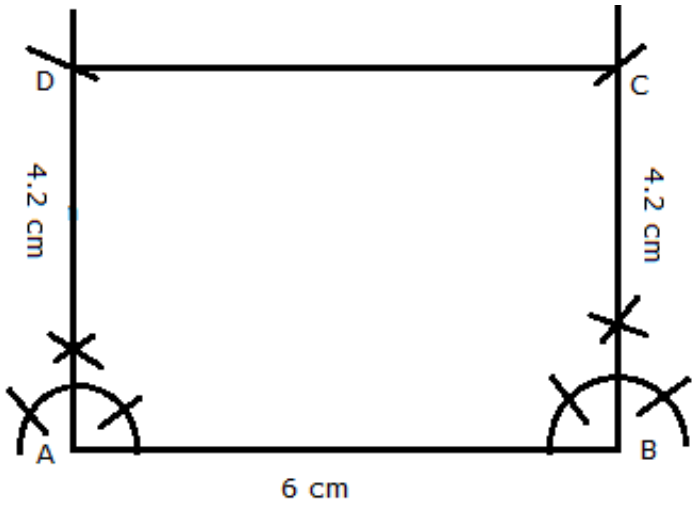
22. Here, F = 10, E = 20 and V = 15
We have
F + V - E = 10 + 15 - 20
= 25 - 20 = 5
Hence, F + V - E ≠ 2
Thus, such a polyhedron is not possible.

23. Distance = 1,433,500,000,000 m
= 14335 × 100000000 m
= 14335 × 10^8 m
= 1.4335 × 10^{12} m

24. Steps of construction:

1) Draw a line segment AB = 6 cm.
2) At A and B, draw two perpendicular rays.
3) With A and B as centers and radius 4.2 cm, draw arcs to cut the perpendiculars at points C and D.
4) Join CD.

ABCD is the required rectangle.



Section C

25. Population of village = 5000

Water required per person per day = 120 liters

Therefore,

Need of water for 5000 persons per day = 120 × 5000 = 6,00,000 liters

Now, capacity of water tank = 20 × 20 × 3 = 1200 m^3 = 1200 × 1000 = 12,00,000 liters

Thus, number of days = $\frac{1200000}{600000} = 2$

Hence, the water of this tank will last for 2 days.

26.

Here, $\frac{u}{v} = \frac{12}{16} = \frac{3}{4}$ ...(a)

(i) Let u = 6 and v = 8

Therefore, $\frac{u}{v} = \frac{6}{8} = \frac{3}{4}$

Since the ratio is same as in (a), so it is the corresponding value of u and v.

(ii) Let u = 15 and v = 20

Therefore, $\frac{u}{v} = \frac{15}{20} = \frac{3}{4}$

Since the ratio is same as in (a), so it is the corresponding value of u and v.

(ii) Let u = 18 and v = 22

Therefore, $\frac{u}{v} = \frac{18}{22} = \frac{9}{11}$

Since the ratio is not same as in (a), so it is not the corresponding value of u and v.

27.

Since, y + 2 is a factor of $4y^4+2y^3-3y^2+8y+5a$, the remainder will be zero.

Using Long Division, we have

$$
\begin{array}{r}
4y^3-6y^2+9y-10 \\
y+2\overline{)\;4y^4+2y^3-3y^2+8y+5a} \\
\underline{(-)4y^4+8y^3} \\
-6y^3-3y^2+8y+5a \\
\underline{(-)-6y^3-12y^2} \\
9y^2+8y+5a \\
\underline{(-)9y^2+18y} \\
-10y+5a \\
\underline{(-)-10y-20} \\
5a+20
\end{array}
$$

Now, 5a + 20 = 0

$\Rightarrow 5a = -20$
$\Rightarrow a = -4$

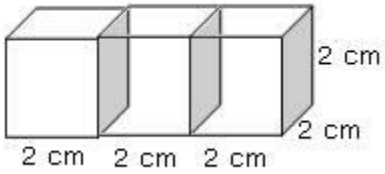
28.

(a) Maximum consumption of potatoes was on Sunday.

(b) On Thursday, the consumption of potatoes went down.

(c) The combined consumption of potatoes on Monday, Tuesday and Wednesday = 15 + 20 + 30 = 65 kg

29.



The edge of given cube = 2 cm

Now, the length of cuboid formed = 2 + 2 + 2 = 6 cm

Breadth of cuboid = 2 cm

Height of cuboid = 2 cm

Therefore total surface area of cuboid

$= 2(lb + bh + hl)$

$= 2(12 + 4 + 12)$

$= 2 \times 28 = 56 \text{ cm}^2$

30. Let the smallest side of the triangle be x cm.

From the given information,

$x = \frac{1}{3}$ (biggest side – 5)

Biggest side = 3x + 15

Also, $x = \frac{1}{2}$(third side – 3)

Third side = 2x + 6

Perimeter of triangle = Smallest side + biggest side + third side

Perimeter = x + (3x + 15) + (2x + 6) = 39

6x + 21 = 39

6x = 39 - 21

6x = 18

x = 3

Smallest side = 3 cm

Biggest side = 3x + 15 = (3 × 3) + 15 = 24 cm

Third side = 2x + 6 = (2 × 3) + 6 = 12 cm

31. For every natural number m > 1, 2m, $m^2 + 1$, $m^2 - 1$ is a Pythagorean triplet.

Let $m^2 + 1 = 10$

$\Rightarrow m^2 = 9$

$\Rightarrow m = 3$

Therefore,

$2m = 6$, $m^2 - 1 = 8$

Thus, the triplet is 6, 8, 10.

But, 10 is not the smallest member of this.

So, let us try $2m = 10$

$\Rightarrow m = 5$

Therefore,

$m^2 + 1 = 25 + 1 = 26$

$m^2 - 1 = 25 - 1 = 24$

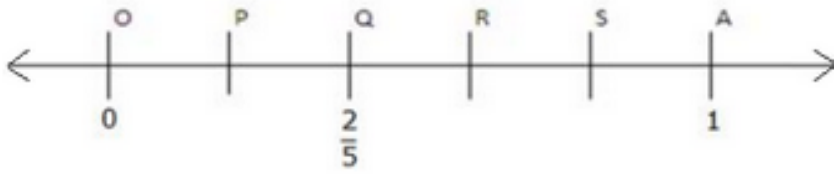
Thus, the required Pythagorean triplet is (10, 24, 26).

32. The number $\frac{2}{5}$ lies between 0 and 1.

Draw a number line. Mark points O and A to represent 0 and 1, respectively.

Divide OA into 5 equal parts (equal to the denominator of $\frac{2}{5}$).

The second point, Q, represents the rational number $\frac{2}{5}$.



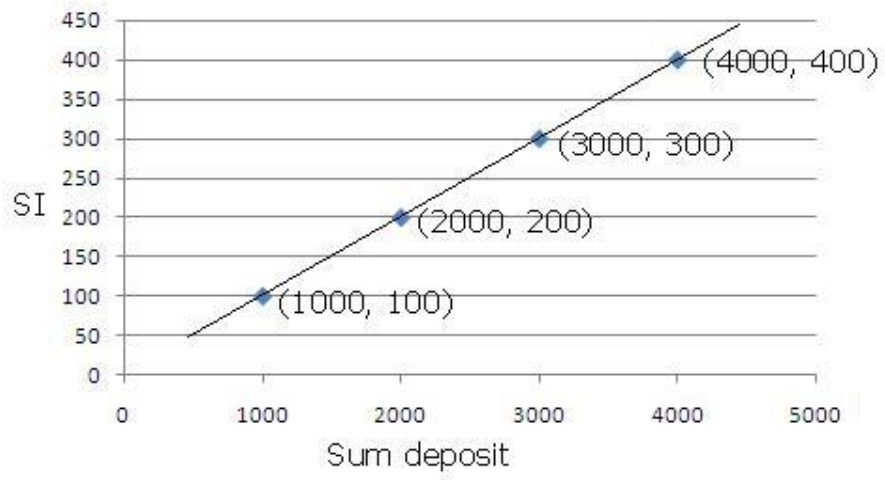
Section D

33. To draw the graph we assume the deposit sum to be Rs 1000, Rs 2000, Rs 3000 and Rs. 4000.

Now we calculate the SI for 1 year for the sum deposit.

Sum deposit	SI
Rs. 1000	$\frac{1000 \times 1 \times 10}{100} = \text{Rs } 100$
Rs. 2000	$\frac{2000 \times 1 \times 10}{100} = \text{Rs } 200$
Rs. 3000	$\frac{3000 \times 1 \times 10}{100} = \text{Rs } 300$
Rs. 4000	$\frac{4000 \times 1 \times 10}{100} = \text{Rs } 400$

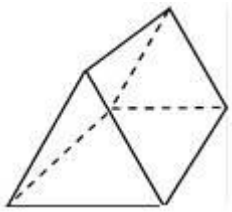
Plotting the points (1000, 100), (2000, 200), (3000, 300) and (4000, 400), we get the graph as below:



34.

(i) Prism: A prism is a solid whose bases are identical polygon faces and the other faces are rectangles. A triangular prism has triangle at the ends.

Diagram:



Verification of Euler's formula:

Here, F = 5, V = 6 and E = 9

Thus, F + V - E = 5 + 6 - 9 = 11 - 9 = 2

F + V - E = 2

Hence, Euler's formula is verified.

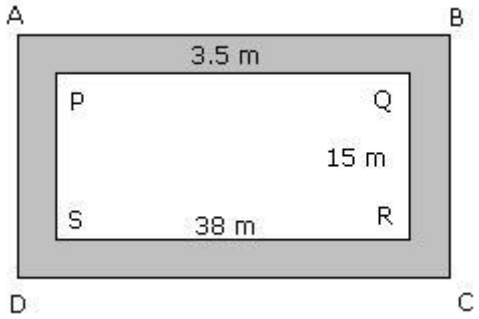
(ii) Cylinder: Cylinder is a solid shape in which top and bottom are circular, while the remaining surface is curved.

Diagram:

Number of faces = 3

Number of edges = 2

35. The given data can be shown in a figure as follows:



Let PQRS represent the rectangular park and the shaded region represent the path 3.5 m wide.

Thus, to find the length AB and breadth BC, we have to add 3.5 m to both sides of rectangular park whose dimensions are 38×15 m^2.

So, the length and breadth of the path are:

Length AB = (38 + 3.5 + 3.5) m = 45 m

Breadth BC = (15 + 3.5 + 3.5) m = 22 m

So, perimeter of the path = $2 \times$ (l + b)

= $2 \times$ (45 + 22)

= $2 \times$ 67 = 134 m

Thus, perimeter of the path is 134 m.

36.

(i) $548 = 500 + 40 + 8 = 5 \times 100 + 4 \times 10 + 8 \times 1$

(ii) $6985 = 6000 + 900 + 80 + 5 = 6 \times 1000 + 9 \times 100 + 8 \times 10 + 5 \times 1$

(iii) $85 = 80 + 5 = 8 \times 10 + 5 \times 1$

(iv) $365 = 300 + 60 + 5 = 3 \times 100 + 6 \times 10 + 5 \times 1$

37.

(i) $\frac{x + 0.25}{3} - x = 0.5$

LCM of 3 and 1 = 3

$\frac{x + 0.25 - 3z}{3} = 0.5$

Multiplying both sides with 3, we get

$0.25 - 2x = 0.5 \times 3$

$0.25 - 2x = 1.5$

Transposing 0.25 to the right hand side

$-2x = 1.5 - 0.25$

$\Rightarrow -2x = 1.25$

$\Rightarrow x = -\frac{1.25}{2}$

(ii) Transposing $\frac{(3x - 1)}{9}$ and -2,

$\frac{(5x + 1)}{12} - \frac{(3x - 1)}{9} = 2$

L.C.M of 12 and 9 = 36

$\frac{3(5x + 1) - 4(3x - 1)}{36} = 2$

Multiplying both sides with 36, we get:

$15x + 3 - 12x + 4 = 72$

$3x = 72 - 7 = 65$

$x = \frac{65}{3} = 21.67$