CLASS NOTES-ANSWERS

EXERCISE 2.2

1. If you subtract $\frac{1}{2}$ from a number and multiply the results by $\frac{1}{2}$, you get $\frac{1}{8}$. What is the number?

Answer:

$\frac{1}{2}(x - \frac{1}{2}) = \frac{1}{8}$

$x - \frac{1}{2} = \frac{1}{8} \times 2$

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

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

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

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

2. The perimeter of a rectangular swimming pool is 154 m. Its length is 2 m more than twice its breadth. What are the length and the breadth of the pool?

Answer:

Let the breadth of swimming pool be x m.

Therefore, the length of the swimming pool will be $(2x + 2)$ m

Perimeter of rectangular swimming pool: 2 × (Length + Breadth)

$2\times (x + 2x + 2) = 154$

$3x + 2 = \frac{154}{2}$

$3x + 2 = 77$

$3x = 77 - 2$

$3x = 75$

$x = \frac{75}{3}$

$x = 25$

Breadth = 25 m

Length = (2 × 25) + 2 = 52 m

3. The base of an isosceles triangle is $\frac{4}{3}$ cm . The perimeter of the triangle is $4\frac{2}{15}$ cm. What is the length of either of the remaining equal sides?

Answer:

Let the length of either of equal sides be x cm.

Perimeter of a Triangle = Sum of the Lengths of all Three Sides

$4\frac{2}{15} = x + x + \frac{4}{3}$

$\frac{62}{15} = 2x + \frac{4}{3}$

$2x = \frac{62}{15} - \frac{4}{3}$

$2x = \frac{62-20}{15}$

$2x = \frac{42}{15}$

$x = \frac{42}{15} \times \frac{1}{2}$

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

Length = $\frac{7}{5}$ cm

4. Sum of two numbers is 95. If one exceeds the other by 15, find the numbers.

Answer:

Let one of the numbers be x .

Then the other number x + 15.

$x + x + 15 = 95$

$2x = 95 - 15$

$2x = 80$

$x = \frac{80}{2}$

$x = 40$

Then other number = $x + 15 = 40 + 15 = 55$

The numbers are 40 and 55.

5. Two numbers are in the ratio 5:3. If they differ by 18, what are the numbers?

Answer:

Two number are in ratio 5:3

The number are $5x$ and $3x$.

The two numbers differ by 18:

$5x - 3x = 18$

$2x = 18$

$x = 9$

First number is $5x = 5 \times 9 = 45$

Second number is $3x = 27$

The numbers will be 45 and 27.

6. Three consecutive integers add up to 51. What are these integers?

Answer:

Let the first integer be *x*.

Then next consecutive two integers are $x + 1$ and $x + 2$

$x + (x + 1) + (x + 2) = 51$

$3x + 3 = 51$

$3x = 51 - 3$

$3x = 48$

$x = \frac{48}{3}$

$x = 16\ x + 1 = 17$

$x + 2 = 18$

Three consecutive integers are 16, 17 and 18.

7. The sum of three consecutive multiples of 8 is 888. Find the multiples.

Answer:

Let the first multiple be x

Then second consecutive multiple of 8 = $x + 8$

Third consecutive multiple of 8 = $x + 8 + 8 = x + 16$

Sum of three consecutive multiples is 888.

$\therefore x + (x + 8) + (x + 16) = 888$

$3x + 24 = 888$

$3x = 888 - 24$

$3x = 864$

$x = 288$

$x + 8 = 296$

$x + 16 = 304$

The multiples are 288, 296 and 304.

8. Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively, they add up to 74. Find these numbers.

Answer:

Let the first integer be x.

Next two consecutive integers are $x+1$ and $x+2$

They are taken in increasing order and multiplied by 2, 3 and 4 respectively.

$x \times 2 = 2x$

$(x+1) \times 3 = 3x+3$

$(x+2) \times 4 = 4x+8$

They add up to 74

$2x+3x+3+4x+8=74$

$9x+11=74$

$9x=74-11$

$9x=63$

$x=7$

$x+1=8$

$x+2=9$

The numbers are 7, 8 and 9.

9. The ages of Rahul and Haroon are in the ratio 5:7. Four years later the sum

of their ages will be 56 years. What are their present ages?

Answer:

Ages of Rahul and Haroon are in ratio 5 :7

Present ages of Rahul and Haroon are 5x and 7x respectively.

Four years later, sum of their ages will be 56 years.

Four years later, age of Rahul = 5x + 4

Four years later, age of Haroon = 7x + 4

$$5x + 4 + 7x + 4 = 56$$

$$12x + 8 = 56$$

$$12x = 56 - 8$$

$$12x = 48$$

$$x = 4$$

Present age of Rahul = $5x = 5 \times 4 = 20$

Present age of Haroon = $7x = 7 \times 4 = 28$

Present age of Rahul and Haroon are 20 and 28 years respectively.

10. The number of boys and girls in a class are in the ratio 7:5. The number of boys is 8 more than the number of girls. What is the total class strength?

Answer:

Number of boys and girls in a class are in ratio 7:5

Number of boys in class = 7x

Number of girls in class = 5x

Number of boys is 8 more than number of girls.

$\therefore 7x = 5x + 8$

$7x - 5x = 8$

$2x = 8$

$x = 4$

Number of boys in class $= 7x = 7 \times 4 = 28$

Number of girls in class $= 5x = 5 \times 4 = 20$

Total class strength = number of boys + number of girls

$= 28 + 20$

$= 48$

$\therefore$ Total class strength is 48 students.

11. Baichung's father is 26 years younger than Baichung's grandfather and 29 years older than Baichung. The sum of the ages of all the three is 135 years. What is the age of each one of them?

Answer:

Let the age of Baichung be x years.

$\therefore$ Age of Baichung's father = x + 29 years as he is 29 years older than Baichung

Age of Baichung's grandfather = age of Baichung father + 26 years

[$\therefore$ since Baichung's father is 26 years younger than Baichung's grandfather]

$x + 29 + 26 = x + 55$ Years

Sum of ages of all the three is 135 years.

$\therefore x + x + 29 + x + 55 = 135$

Ages: Baichung father grandfathers.

$3x + 84 = 135$

$3x = 135 - 84$

$3x = 51$

$x = 17$

Age of Baichung is 17 years

Age of Baichung's father is $x + 29 = 17 + 29 = 46$ years

Age of Baichung's grandfathers is $x + 55 = 17 + 55 = 72$ years

12. Fifteen years from now Ravi's age will be four times his present age. What is Ravi's present age?

Answer:

Let the present age of Ravi be x years.

15 years from now, Ravi's age will be 4 times his present age

$x + 15 = 4x$

$x - 4x = -15$

$-3x = -15$

$x = 5$

$\therefore$ Ravi's present age is 5 years.

13. A rational number is such that when you multiply it by $\frac{5}{2}$ and add $\frac{2}{3}$ to the product, you get $-\frac{7}{12}$. What is the number?

Answer:

Let the rational number be x

$\frac{5x}{2} + \frac{2}{3} = -\frac{7}{12}$

$\frac{5x}{2} = -\frac{7}{12} - \frac{2}{3}$

$\frac{5x}{2} = \frac{-7-8}{12}$

$\frac{5x}{2} = \frac{-15}{12}$

$5x \times 12 = -15 \times 2$

$x = \frac{-15 \times 2}{5 \times 12}$

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

The rational number is $\frac{-1}{2}$.

14. Lakshmi is a cashier in a bank. She has currency notes of denominations ₹ 100, ₹ 50 and ₹ 10, respectively. The ratio of the number of these notes is 2:3:5. The total cash with Lakshmi is ₹ 4,00,000. How manynotes of each denomination does she have?

Answer:

(i) Lakshmi has currency notes of denomination Rs.100, Rs.50, Rs.10.

(ii) Number of notes are in ratio 2:3:5, therefore number of notes is 2x, 3x and 5x

Denomination	Number of notes	Total
RS .100	2 x	200 x
RS. 50	3 x	150 x
RS. 10	5 x	50 x

$200x + 150x + 50x = 400000$

$400x = 400000$

$x = 1000$

Denomination	Number of notes
RS. 100	$2x = 2 \times 1000 = 2000$
RS. 50	$3x = 3 \times 1000 = 3000$
RS. 10	$5x = 5 \times 1000 = 5000$

15. I have a total of ₹ 300 in coins of denomination ₹ 1, ₹ 2 and ₹ 5. The number of ₹ 2 coins is 3 times the number of ₹ 5 coins. The total number of coins is 160. How many coins of each denomination are with me?

Answer:

Let the number of Rs 5 coins be x.

Then the number of Rs.2 coins is 3x.

Number of Rs.1 coin is $= 160 - (x + 3x)$ [$\because$ as total coins are 160]

$= 160 - 4x$

Denomination	**Number of coins**	**Amount**
RS.1	160-4x	160-4x
RS.2	3x	6x
RS.5	x	5x

$160 - 4x + 6x + 5x = 300$

$160 + 7x = 300$

$7x = 300 - 160$

$7x = 140$

$x = 20$

Denomination	**Number of coins**
RS. 1	$160 - 4x = 160 - 80 = 80$
RS. 2	$3x = 3 \times 20 = 60$
RS. 5	$x = 20$

16. The organisers of an essay competition decide that a winner in the competition gets a prize of ₹ 100 and a participant who does not win gets a prize of ₹ 25. The total prize money distributed is ₹ 3,000. Find the number of winners, if the total number of participants is 63.

Answer:

Let the number of number of winners be x

Then the number of participants who do not win = $63 - x$

Total prize money = Rs. 3000

[number of winners $\times 100$] + [number of participants who do not win $\times$ 25] = 3000

$$(x \times 100) + (63 - x)\ 25 = 3000$$

$$100x + 1575 - 25x = 3000$$

$$75x + 1575 = 3000$$

$$75x = 3000 - 1575$$

$$75x = 1425$$

$$x = 19$$

Number of winners is 19.