

EXERCISE 8.4

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1. If 5 is subtracted from three times a number, the result is 16. Find the number.

**Solution:**

Let the required number be  $x$ .

Then, given that 5 subtracted from 3 times  $x$  i.e.  $3x - 5$

$$\Rightarrow 3x - 5 = 16$$

Adding 5 to both sides, we get

$$\Rightarrow 3x - 5 + 5 = 16 + 5$$

$$\Rightarrow 3x = 21$$

Dividing both sides by 3, we get

$$\Rightarrow 3x/3 = 21/3$$

$$\Rightarrow x = 7$$

Thus, the required number is  $x = 7$ .

2. Find the number which when multiplied by 7 is increased by 78.

**Solution:**

Let the required number be  $x$ .

Given that, when multiplied by 7, it gives  $7x$ , and  $x$  increases by 78.

According to the question we can write as  $7x = x + 78$

Transposing  $x$  to LHS, we get

$$\Rightarrow 7x - x = 78$$

$$\Rightarrow 6x = 78$$

Dividing both sides by 6, we get

$$\Rightarrow 6x/6 = 78/6$$

$$\Rightarrow x = 13$$

Thus, the required number is  $x = 13$ .

3. Find three consecutive natural numbers such that the sum of the first and second is 15 more than the third.

**Solution:**

Let first number be  $x$ .

According to the question second number is  $x + 1$  and the third is  $x + 2$

Sum of first and second numbers =  $(x) + (x + 1)$ .

According to question:

$$\Rightarrow (x) + (x + 1) = 15 + (x + 2)$$

$$\Rightarrow 2x + 1 = 17 + x$$

Transposing  $x$  to LHS and 1 to RHS, we get

$$\Rightarrow 2x - x = 17 - 1$$

$$\Rightarrow x = 16$$

So, first number =  $x = 16$ ,

Second number =  $x + 1 = 16 + 1 = 17$

And third number =  $x + 2 = 16 + 2 = 18$

Thus, the required consecutive natural numbers are 16, 17 and 18.

**4. The difference between two numbers is 7. Six times the smaller plus the larger is 77. Find the numbers.**

**Solution:**

Let the smaller number be ' $x$ '.

So, the larger number =  $x + 7$ .

According to question:

$$\Rightarrow 6x + (x + 7) = 77$$

$$\Rightarrow 6x + x + 7 = 77$$

On simplifying we get

$$\Rightarrow 7x + 7 = 77$$

Subtracting 7 from both sides, we get

$$\Rightarrow 7x + 7 - 7 = 77 - 7$$

$$\Rightarrow 7x = 70$$

Dividing both sides by 7, we get

$$\Rightarrow 7x/7 = 70/7$$

$$\Rightarrow x = 10$$

Thus, the smaller number =  $x = 10$

And the larger number =  $x + 7 = 10 + 7 = 17$ .

The two required numbers are 10 and 17.

**5. A man says, "I am thinking of a number. When I divide it by 3 and then add 5, my answer is twice the number I thought of". Find the number.**

**Solution:**

Let the required number be  $x$ .

So, according to question:

$$\Rightarrow x/3 + 5 = 2x$$

Transposing  $x/3$  to RHS, we get

$$\Rightarrow 5 = 2x - (x/3)$$

$$\Rightarrow 5 = (6x - x)/3$$

$$\Rightarrow 5 = (5x/3)$$

Multiplying both sides by 3 we get,

$$\Rightarrow 5 \times 3 = (5x/3) \times 3$$

$$\Rightarrow 15 = 5x$$

Dividing both sides by 5 we get

$$\Rightarrow 15/5 = 5x/5$$

$$\Rightarrow 3 = x$$

Thus the number thought of by the man is 3.

**6. If a number is tripled and the result is increased by 5, we get 50. Find the number.**

**Solution:**

Let the required number be 'x'.

According to question:

$$\Rightarrow 3x + 5 = 50$$

Subtracting 5 from both sides, we get

$$\Rightarrow 3x + 5 - 5 = 50 - 5$$

$$\Rightarrow 3x = 45$$

Dividing both sides by 3, we get

$$\Rightarrow 3x/3 = 45/3$$

$$\Rightarrow x = 15$$

Therefore, the required number is 15.

**7. Shikha is 3 years younger to her brother Ravish. If the sum of their ages 37 years, what are their present age?**

**Solution:**

Let the present age of Shikha be x years.

Therefore, the present age of Shikha's brother Ravish = (x + 3) years.

So, sum of their ages = x + (x + 3)

$$\Rightarrow x + (x + 3) = 37$$

$$\Rightarrow 2x + 3 = 37$$

Subtracting 3 from both sides, we get

$$\Rightarrow 2x + 3 - 3 = 37 - 3$$

$$\Rightarrow 2x = 34$$

Dividing both sides by 2, we get

$$\Rightarrow 2x/2 = 34/2$$

$$\Rightarrow x = 17$$

Therefore, the present age of Shikha = 17 years,

And the present age of Ravish =  $x + 3 = 17 + 3 = 20$  years.

**8. Mrs Jain is 27 years older than her daughter Nilu. After 8 years she will be twice as old as Nilu. Find their present ages?**

**Solution:**

Let the present age of Nilu be  $x$  years

Therefore the present age of Nilu's mother =  $(x + 27)$  years

So, after 8 years,

Nilu's age =  $(x + 8)$ , and Mrs Jain's age =  $(x + 27 + 8) = (x + 35)$  years

$$\Rightarrow x + 35 = 2(x + 8)$$

Expanding the brackets, we get

$$\Rightarrow x + 35 = 2x + 16$$

Transposing  $x$  to RHS and 16 to LHS, we get

$$\Rightarrow 35 - 16 = 2x - x$$

$$\Rightarrow x = 19$$

So, the present age of Nilu =  $x = 19$  years,

And the present age of Nilu's mother that is Mrs Jain =  $x + 27 = 19 + 27 = 46$  years.

**9. A man 4 times as old as his son. After 16 years, he will be only twice as old as his son. Find their present ages.**

**Solution:**

Let the present age of the son =  $x$  years.

Therefore, the present age of his father =  $4x$  years.

So, after 16 years,

Son's age =  $(x + 16)$  and father's age =  $(4x + 16)$  years

According to question:

$$\Rightarrow 4x + 16 = 2(x + 16)$$

$$\Rightarrow 4x + 16 = 2x + 32$$

Transposing  $2x$  to LHS and  $16$  to RHS, we get

$$\Rightarrow 4x - 2x = 32 - 16$$

$$\Rightarrow 2x = 16$$

Dividing both sides by  $2$ , we get

$$\Rightarrow 2x/2 = 16/2$$

$$\Rightarrow x = 8$$

So, the present age of the son =  $x = 8$  years,

And the present age of the father =  $4x = 4(8) = 32$  years.

**10. The difference in age between a girl and her younger sister is 4 years. The younger sister in turn is 4 years older than her brother. The sum of the ages of the younger sister and her brother is 16. How old are the three children?**

**Solution:**

Let the age of the girl =  $x$  years.

So, the age of her younger sister =  $(x - 4)$  years.

Thus, the age of the brother =  $(x - 4 - 4)$  years =  $(x - 8)$  years.

According to question:

$$\Rightarrow (x - 4) + (x - 8) = 16$$

$$\Rightarrow x + x - 4 - 8 = 16$$

$$\Rightarrow 2x - 12 = 16$$

Adding  $12$  to both sides, we get

$$\Rightarrow 2x - 12 + 12 = 16 + 12$$

$$\Rightarrow 2x = 28$$

Dividing both sides by  $2$ , we get

$$\Rightarrow 2x/2 = 28/2$$

$$\Rightarrow x = 14$$

Thus, the age of the girl =  $x = 14$  years,

The age of the younger sister =  $x - 4 = 14 - 4 = 10$  years,

The age of the younger brother =  $x - 8 = 14 - 8 = 6$  years.

**11. One day, during their vacation at beach resort, Shella found twice as many sea shells as Anita and Anita found 5 shells more than sandy. Together sandy and Shella found 16 sea shells. How many did each of them find?**

**Solution:**

Let the number of sea shells found by sandy =  $x$

So, the number of sea shells found by Anita =  $(x + 5)$ .

The number of sea shells found by Shella =  $2(x + 5)$ .

According to the question,

$$\Rightarrow x + 2(x + 5) = 16$$

$$\Rightarrow x + 2x + 10 = 16$$

$$\Rightarrow 3x + 10 = 16$$

Subtracting 10 from both sides, we get

$$\Rightarrow 3x + 10 - 10 = 16 - 10$$

$$\Rightarrow 3x = 6$$

Dividing both sides by 3, we get

$$\Rightarrow 3x/3 = 6/3$$

$$\Rightarrow x = 2$$

Thus, the number of sea shells found by Sandy =  $x = 2$ ,

The number of sea shells found by Anita =  $x + 5 = 2 + 5 = 7$ ,

The number of sea shells found by Shelia =  $2(x + 5) = 2(2 + 5) = 2(7) = 14$ .

**12. Andy has twice as many marbles as Pandy, and Sandy has half as many as Andy and Pandy put together. If Andy has 75 marbles more than Sandy. How many does each of them have?**

**Solution:**

Let the number of marbles with Pandy =  $x$

So, the number of marbles with Andy =  $2x$

Thus, the number of marbles with Sandy =  $(x/2) + (2x/2) = (3x/2)$

According to the question:

$$\Rightarrow 2x + 75 = (3x/2)$$

By transposing we get

$$\Rightarrow 2x - (3x/2) = -75$$

$$\Rightarrow (4x - 3x)/2 = -75$$

$$\Rightarrow (x/2) = -75$$

$$\Rightarrow x = -150$$

Since number of marbles cannot be negative

Therefore  $x = 150$

So, Pandy has 150 marbles,

Andy has  $2x = 2(150) = 300$  marbles,

Sandy has  $3x/2 = 225$  marbles.

**13. A bag contains 25 paise and 50 paise coins whose total value is Rs 30. If the number of 25 paise coins is four times that of 50 paise coins, find the number of each type of coins.**

**Solution:**

Let the number of 50 paise coins =  $x$

So, the money value contribution of 50 paise coins in bag =  $0.5x$ .

The number of 25 paise coins in bag =  $4x$

The money value contribution of 25 paise coins in bag =  $0.25 (4x) = x$ .

According to the question,

$$\Rightarrow 0.5x + x = 30$$

$$\Rightarrow 1.5x = 30$$

Dividing both sides by 1.5, we get

$$\Rightarrow 1.5x/1.5 = 30/1.5$$

$$\Rightarrow x = 20$$

Thus, the number of 50 paise coins =  $x = 20$ ,

The number of 25 paise coins =  $4x = 4 (20) = 80$ .

**14. The length of a rectangular field is twice its breadth. If the perimeter of the field is 228 meters, find the dimensions of the field.**

**Solution:**

Let the breadth of the rectangle =  $x$  metres.

According to the question,

Length of the rectangle =  $2x$  metres

Perimeter of a rectangle =  $2 (\text{length} + \text{breadth})$

$$\text{So, } 2 (2x + x) = 228$$

$$\Rightarrow 2 (3x) = 228$$

$$\Rightarrow 6x = 228$$

Dividing both sides by 6, we get

$$\Rightarrow 6x/6 = 228/6$$

$$\Rightarrow x = 38$$

So, the breadth of the rectangle =  $x = 38$  metres,

The length of the rectangle =  $2x = 2(38) = 76$  metres.

**15. There are only 25 paise coins in a purse. The value of money in the purse is Rs 17.50. Find the number of coins in the purse.**

**Solution:**

Let the number of 25-paise coins in the purse be  $x$

So, the value of money in the purse =  $0.25x$ .

But  $0.25x = 17.50$ .

Dividing both sides by 0.25, we get

$$\Rightarrow 0.25x/0.25 = 17.5/0.25$$

$$\Rightarrow x = 70$$

Thus, the number of 25 paise coins in the purse = 70.

**16. In a hostel mess, 50kg rice are consumed every day. If each student gets 400gm of rice per day, find the number of students who take meals in the hostel mess.**

**Solution:**

Let the number of students in the hostel be  $x$

Quantity of rice consumed by each student = 400 gm.

So, daily rice consumption in the hostel mess =  $400(x)$ .

But, daily rice consumption = 50 kg =  $50 \times 1000 = 50000$ gm [since 1 kg = 1000gm].

According to the question,

$$\Rightarrow 400x = 50000$$

Dividing both sides by 400, we get

$$\Rightarrow 400x/400 = 50000/400$$

$$\Rightarrow x = 125$$

Thus, 125 students have their meals in the hostel mess.

