

~ Question No. 6 ~

**Part A**

Sol:-

$$\text{Length of boat} = 3\text{m}$$

$$\text{Breadth of boat} = 2\text{m}$$

$$\text{Depth of boat} = 1\text{cm} = 0.01\text{m}$$

$$1\text{m} = 100\text{cm}$$

$$\frac{1}{100} = 0.01\text{m}$$

(The boat sinks by 1cm when a man gets on it means depth)

$$\text{Volume of water displaced} = L \times B \times D$$

$$= 3\text{m} \times 2\text{m} \times 0.01\text{m}$$

$$= 0.06\text{m}^3 \quad [\text{Mass of D. water} = \text{Mass of D. Man}]$$

$$\bullet \text{ The density of water} = 1000\text{kg/m}^3$$

$$\rightarrow \text{The mass of displaced water} =$$

$$\text{Density of water} \times \text{Volume displaced}$$

$$= 1000\text{kg/m}^3 \times 0.06\text{m}^3$$

$$= 1000\text{kg/m}^3 \times \frac{6}{100}\text{m}^3$$

$$= 60\text{kg}$$

So, The man's mass is **60kg**.

## Part B

Sol:-

Selling price of <sup>17</sup> balls = Rs. 720

Number of balls = 17

Loss = Cost price of 5 balls

Cost Price of a ball = ?

Let the cost price of one ball =  $x$

Given that

• Loss equal to the cost price of 5 balls

$$\text{Loss} = 5x$$

• Cost Price of 17 balls =  $17x$

Loss = Cost Price - Selling Price

$$5x = 17x - 720$$

$$720 = 17x - 5x$$

$$720 = 12x$$

$$\frac{720}{12} = x \Rightarrow 60 = x$$

$$x = 60$$

The cost price of one ball is **Rs. 60**

## Part C

Sol:- Let the present age of son =  $x$

• Man's age is 24 years older than his son

$$\text{Man's present age} = x + 24$$

• In 2 years

$$\text{Son's age} = x + 2$$

$$\begin{aligned} \text{Man's age} &= x + 24 + 2 \\ &= x + 26 \end{aligned}$$

• Given that

In 2 years, Man's age will be twice the age of his son

$$x + 26 = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$26 - 4 = 2x - x$$

$$x = 22$$

The present age of son is  
22 years.

### Part D

Sol:-

• Rashid takes 6 hours to type 32 pages

• Kamra takes 5 hours to type

40 pages  
• Time taken by both to type  
110 pages together = ?

• Rashid's rate (page type in  
one hour) =  $\frac{32}{6} = 5.33$   
= 5.33 page per hour

• Kamaran's rate (page type in  
one hour) =  $\frac{40}{5} = 8$  page per hour

Their combined rate =  $5.33 + 8$   
= 13.33 pages per hour.

• Time to type 110 pages =  $\frac{110 \text{ pages}}{13.33 \text{ per hour}}$   
 $\frac{110}{40/3} \Rightarrow \frac{110 \times 3}{40} = \frac{330}{40}$   
= 8.25 hours

8.25 = 8 hours and 15 minutes

So, both will take 8 hours 15  
minutes to type 110 pages together.

~ (Question No 8) ~

**Part A**

Sol:-

• Ratio of length to breadth of a park = 3:2

• Man cycling at speed of = 12 km/h

• Time taken to complete one round = 8 minutes

Converting 8 minutes into hours

$$\frac{8 \times 2}{60 \times 15} = \frac{2}{15} \text{ hours}$$

Perimeter (Distance) = Speed  $\times$  Time

$$= 12 \text{ km/h} \times \frac{2}{15}$$

$$= \frac{8}{5} \text{ km/h}$$

$$= 1.6 \text{ km/h}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$= 1.6 \times 1000 = 1600 \text{ m}$$

• Let ratio for both length and breadth

$$\text{Length} = 3x$$

$$\text{breadth} = 2x$$

• Perimeter of Rectangle =  $2 \times (L + b)$

$$1600 = 2 \times (3x + 2x)$$

$$1600 = 2 \times 5x$$

$$1600 = 10x$$

$$x = \frac{1600}{10}$$

$$x = 160$$

$$\text{Length} = 3x = 3(160) = 480 \text{ m}$$

$$\text{Breadth} = 2x = 2(160) = 320 \text{ m}$$

• Area of the park = Length  $\times$  breadth

$$= 480 \times 320$$

$$= 153600 \text{ sq. m}$$

The area of the park is 153,600

Square meters.

### Part B

Sol:-

Father of my uncle = girl's grandfather

Daughter of grand father =

sister of girl's parents who is

girl's aunt

Son of the aunt means girl's

first cousin

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so, the boy is the girl's first  
cousin.

### Part C

Sol:-

- Unit's digit exceeds the ten's digit by 2.
- The product of given number and sum of its digits = 144
- Ten number = ?

Let the ten's digit is =  $x$  — ①

Unit digit =  $x + 2$  — ②

$$\begin{aligned}\text{Two-digit number} &= 10x + (x + 2) \\ &= 10x + x + 2 \\ &= 11x + 2\end{aligned}$$

$$\begin{aligned}\text{Sum of digit} &= \text{ten's digit} + \text{unit's digit} \\ &= x + x + 2 \\ &= 2x + 2\end{aligned}$$

Given that

Product of number \* Sum of digits = 144

$$(11x + 2) \times (2x + 2) = 144$$

$$22x^2 + 22x + 4x + 4 = 144$$

$$22x^2 + 26x + 4 = 144$$

$$22x^2 + 26x + 4 - 144 = 0$$

$$22x^2 + 26x - 140 = 0$$

$$2(11x^2 + 13x - 70) = 0$$

$$11x^2 + 13x - 70 = 0$$

$$11x^2 + 35x - 22x - 70 = 0$$

$$x(11x + 35) - 2(11x + 35) = 0$$

$$(x - 2)(11x + 35) = 0$$

$$x - 2 = 0, \quad 11x + 35 = 0$$

$$x = 2, \quad 11x = -35$$

$$x = \frac{-35}{11}$$

putting value of  $x$  in equation (2)

$$\bullet \text{ Unit digit} = x + 2$$

$$= 2 + 2$$

$$= 4$$

$$\bullet \text{ Two-digit number} = 11x + 2$$

$$= 11(2) + 2$$

$$= 22 + 2$$

$$= 24$$

$$\bullet \text{ Sum of digit} = 2x + 2$$

$$= 2(2) + 2$$

$$= 6$$



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$$\text{Number} = 24$$

$$\text{Sum of digit} = 6$$

$$\text{Product of number and sum of digit} = 144$$

$$24 \times 6 = 144$$

So, the number is **24**.

### Part D

Sol:-

Given that

• The L.C.M of two number is 48

• The ratio of two number is 2:3

• Sum of number = ?

Let 'x' is the common multiple factor of two number's ratio

Multiples of 2x = 2x, 4x, 6x, 8x, 10x, 12x

Multiples of 3x = 3x, 6x, 9x, 12x, 15x, 18x

The smallest common multiple in both multiples is 6x

$$\text{LCM} = 48$$

$$6x = 48$$

$$x = \frac{48}{6}$$

$$x = 8$$

Putting value of  $x$  in two numbers

• First number  $2x = 2(8) = 16$

• Second number  $3x = 3(8) = 24$

The sum of two numbers =

$$16 + 24$$

$$= 40$$

So, the sum of numbers is **40**.