

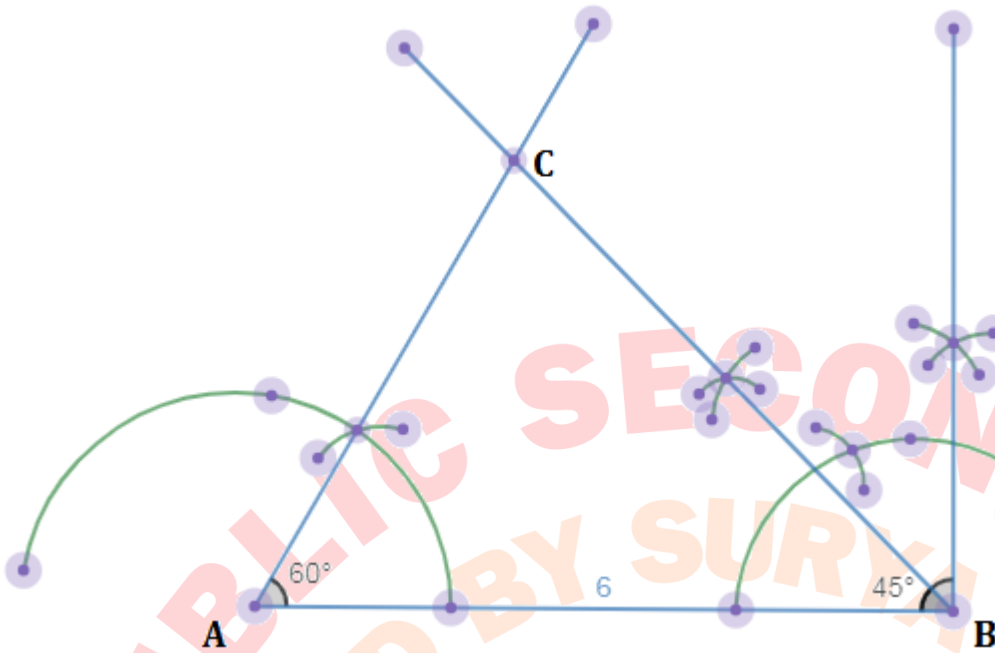
RIMC Answer Key
Subject : Maths
12 September 2020

1. $1/8000$
2. $17/24$ and $33/48$
- 3.

$$\begin{array}{r} 9) \ 4 \ 8 \ 6 \ (\ 5 \ 4 \\ \underline{- \ 4 \ 5} \\ \ 3 \ 6 \\ \underline{- \ 3 \ 6} \\ \ 0 \end{array}$$

4. 44
5. 18 and 19
6. 15 years
7. 13 m, 22 m and 22 m.
8. $x = 40^\circ$ and $y = 50^\circ$
9. Rs. 759
10. 156 m^2
11. $m = -1$
12. 5
13. $x-2$
14. 28 years
15. 360°
16. 154 cm^2
17. Circle has more area than square.
18. 81
19. 12.5%
20. 14 and 20
21. $5q - [2p - 3q - 3\{5r - 2(p - 2q + 3r)\}]$
 $= 5q - [2p - 3q - 3\{5r - 2p + 4q - 6r\}]$
 $= 5q - [2p - 3q - 15r + 6p - 12q + 18r]$
 $= 5q - 2p + 3q + 15r - 6p + 12q - 18r$
 $= 5q + 3q + 12q - 2p - 6p + 15r - 18r$
 $= 20q - 8p - 3r$

22.



BC = 5.4 cm
AC = 4.4 cm

23.

$$9(x+2) = 240 + 9x$$

or $9 \times 9^2 = 240 + 9x$

or $81 \cdot 9^x = 240 + 9^x$

or $9^x(81 - 1) = 240$

or $9^x \cdot 80 = 240$

or $9^x = 3$

or $3^{2x} = 3^1$

[use, $x^m = x^n$ then, $m = n$]

$$2x = 1$$

$$x = 1/2$$

24.

Dimensions of Bricks

$l=25$ cm
 $b=12.5$ cm
 $h=7.5$ cm

Dimensions of Wall

$l=6$ m = 600 cm
 $b=50$ cm
 $h=5$ m = 500 cm

volume of wall

$=l \times b \times h$
 $=600 \times 50 \times 500$
 $=15000000$ cubic cm

volume of mixture

$=1/20 \times 15000000$
 $=750000$ cubic cm

volume left

$=15000000 - 750000$
 $=14250000$ cubic cm

required bricks

$=14250000 / (25 \times 12.5 \times 7.5)$
 $=6080$ bricks

25. $V_{2001} = 92610$
 $V_{1999} = 80000$
 Or $V_{2001} = V_{1999}(1+r/100)^n$
 Or $92610 = 80000(1+r/100)^3$

$$92610/80000 = (1+r/100)^3$$

$$\text{Or } (21/20)^3 = (1+r/100)^3$$

By comparison of both the sides -

$$\text{or } 21/20 - 1 = r/100$$

$$(21-20)/20 = r/100$$

$$\text{or } 1/20 = r/100$$

$$\text{or } 100/20 = r$$

$$\text{or } 5\% = r$$

26. Let the numbers be $3x$ and $5x$.
 If each number is increased by 10.
 then according to question -

$$(3x+10)/(5x+10) = 5/7$$

$$21x + 70 = 25x + 50$$

$$21x - 25x = 50 - 70$$

$$-4x = -20$$

$$x = 5.$$

Then, Numbers are 15 and 25.

27. Let the speed of the boat in still water be x .
 Given that the speed of the stream is 3km/h.

Upstream:

$$\text{Speed} = (x - 3) \text{ km/h}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Distance} = 6(x - 3) \text{ km}$$

Downstream:

$$\text{Speed} = (x + 3) \text{ km/h}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Distance} = 5(x + 3) \text{ km}$$

Since both the distances are the same:

$$6(x - 3) = 5(x + 3)$$

$$6x - 18 = 5x + 15$$

$$x = 33 \text{ km/h}$$

So, the speed of the boat in still water is 33 km/h

28. Total cost of 2 TV sets = Rs. 42500

Let the cost of First TV set be x

Then,

Cost of second TV set = Rs. (42500-x)

Selling price of First TV set is

$$SP_1 = x + 10\% \text{ of } x$$

$$SP_1 = \frac{110x}{100}$$

Selling price of second TV set is

$$SP_2 = 42500 - x - 10\% \text{ of } (42500 - x)$$

$$SP_2 = \frac{90(42500-x)}{100}$$

S.P of First TV set = S.P of Second TV set

$$\frac{110x}{100} = \frac{90(42500-x)}{100}$$

$$11x = 90(42500 - x)$$

$$11x = 382500 - 9x$$

$$20x = 382500$$

$$x = 19125$$

Therefore, Cost Price of First set = Rs. 19125

Cost Price of Second set = Rs. 23375

29. Let x km be the distance between his house and office.
While travelling at 24kmph, he would take $x/24$ hours.
While travelling at 25% faster speed,

i.e. $24+25\%$ of 24 = $24 + 24 \times 1/4 = 30$ km/hr, he would take $x/30$ hours.

Now as per the problem, time difference = 5 min late + 4 min early = 9 min

$$x/24 - x/30 = 9 \text{ min} = 9/60 \text{ hours}$$

$$(5x-4x)/120 = 9/60$$

$$x/120 = 9/60$$

$$x = (9 \times 120)/60$$

$$x = 18 \text{ km}$$

So 18 km be the distance between his house and office.

30. External length = 98 cm
External breadth = 84 cm
External height = 77 cm
The wood is 2 cm thick all round.
Internal length = $98-(2+2)=94$ cm
Internal breadth = $84 \text{ cm} -(2+2)= 80$ cm
Internal height = $77-2 = 75$ cm
Volume of wood = External volume - Internal volume
= $98 \times 84 \times 77 - 94 \times 80 \times 75$
= $633864 - 564000$
= 69864 cm^3

Hence, the volume of wood is 69864 cm^3 .

$$\text{Weight of } 1 \text{ cm}^3 = 0.8 \text{ gm}$$

$$\text{Weight of } 69864 \text{ cm}^3 = 0.8 \times 69864$$

$$= 55891.2 \text{ gms}$$

$$= 55.891 \text{ kg}$$