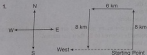


# Hints and Solutions



So, answer is West.



4. Gopal had ₹ 100 that Sindhu borrowed from him ₹ 50 that Krenal took from him ₹ 400 that he lost due to theft.

so, total money he had  $(100 + 50 + 400) = ₹ 550$

5. 14 boys (Mohan) 14 boys



Total number of boys in the row =  $14 + 1 + 14 = 29$

6. The first, third and fifth letters of the word are each moved one step backward, the second, fourth and sixth letters are moved one, two and three steps forward respectively to obtain the corresponding letters of the code.

7. Due to letters 'A', the word CAUTION cannot be formed using the letters of original word.

8. As 600 rooms are double and 50 rooms have wash basins, therefore one can be certain that some double rooms have wash basins.

$$100 + 50 + 400 = 550$$

9.  $x : x^2 = (3) : 3^2 = 9$

Similarly,  $(6)$  and  $(6)^2 = 1296$

10. As from 'Television', we get news, in the same way, from 'Television', we get message.

11. As 'Crime' is treated in a 'Court', in the same way, 'Sickness' is treated in the 'Hospital'.



In the same way,



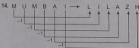
13. According to alphabetical order,

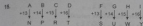
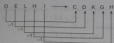
$$M = 13 \text{ and } N = 14$$

So,  $M \times N = 13 \times 14$

In the same way,  $P = 6$  and  $R = 18$

Hence,  $F \times R = 6 \times 18$





18. A surgeon uses forceps, similarly, a blacksmith uses hammer.



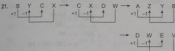
Similarly,



18.  $55 \div 5 = 275$ ,  $15 \times 15 = 225$   
 $5 \times 45 = 225$ ,  $25 \times 9 = 225$

18. Only 'Redeem' has different meaning whereas the other three words have similar meanings.

20. 'Animals' are different word while Jungle, Forest and Woods have same meaning.



22. All other groups of letters have (+2) series gap in each of them.

23.  $2 \times 5 = 10$ ,  $10 \times 6 = 60$ ,  $60 - 2 = 58$   
 $4 \times 5 = 20$ ,  $20 \times 3 = 60$ ,  $60 - 4 = 56$

24. Only 119 has different factors, 7 and 17 and no factor is repeated.

25. In all other groups, the consecutive letters are arranged alternatively.

26. In the first row, 18 is obtained by subtracting 32 from 50. Similarly, in the second row, 30 is obtained by subtracting 42 from 72. Hence, the number to occupy the missing number will be obtained by subtracting 14 from 29.

27. Whiter, Worked, Worst, Wound, Writer

28. Following is the order of the given words in which they occur in the dictionary.

Costume, Cupboard, Custom, Customary

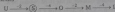
Since, the word in third place is Custom.

29. The series can be formed with the group of four letters.  
 $a b \leq d$ ,  $a b c \leq d$ ,  $a \leq c \leq d$ ,  $a b \leq c d$

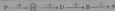
30. This is a simple multiplication series. Each number is 3 times more than the previous numbers.

31. The letters decreases by 1 and the numbers are multiplied by 2.

32. 1st letter



- 2nd letter



- 3rd letter



33. The correct sequence is  $5^2$ ,  $7^2$ ,  $9^2$ ,  $11^2$ ,  $13^2$  and  $15^2$ . So, 36 is wrong.

34. Let son's age be  $x$  yr.

Then, father's age =  $(3x)$  yr

Five years ago, father's age =  $(3x - 5)$  yr

And son's age =  $(x - 5)$  yr

So,  $3x - 5 = 4(x - 5)$

$\Rightarrow 3x - 5 = 4x - 20$

$\Rightarrow x = 15$

35. Clearly, number of boys in the row =  $(6 + 10 + 8) = 24$

37. Total number of digits

= (Number of digits in 1-digit page nos. + Number of digits in 2-digit page nos. + Number of digits in 3-digit page nos.)

$$= (1 \times 9 + 2 \times 90 + 3 \times 267)$$

$$= (9 + 180 + 801) = 990$$

38. Let the total number of sweets be  $(25x + 8)$ .

Then,  $(25x + 8) - 22$  is divisible by 28.

$$\Rightarrow (25x - 14) \text{ is divisible by } 28.$$

$$\Rightarrow 28x - (3x + 14) \text{ is divisible by } 28.$$

$$\Rightarrow (3x + 14) \text{ is divisible by } 28.$$

$$\Rightarrow x = 14$$

$$\therefore \text{Total number of sweets} = (25 \times 14 + 8) = 358$$

39.  $12 - 2 + 9 - 4 = x$

$$6 + 9 - 4 = x$$

$$15 - 4 = x$$

$$\therefore x = 11$$

40. Number of days from March 6, 1993 to August 15, 1993.

March — April — May — June — July — August

$$= 25 + 30 + 31 + 30 + 31 + 15$$

$$= 162 \text{ days} = 23 \text{ weeks} + 1 \text{ day}$$

Clearly, the day on March 6, will be the same as on August 14 i.e., Thursday.

41. The sequence in first column is  $\times 5$ .

$$\text{Thus, } 1 \times 5 = 5, 5 \times 5 = 25, 25 \times 5 = 125$$

The sequence in third column is  $\times 2$ .

Thus,  $7 \times 2 = 14$ ,  $14 \times 2 = 28$ ,  $28 \times 2 = 56$

The sequence in second column is  $\times 4$

$\therefore$  Missing number =  $12 \times 4 = 48$

42. In the first column,  $29 - 8 = 7 \times 3 = 21$

In the second column,  $19 - 7 = 4 \times 3 = 12$

Let the missing number in the third column be  $x$ .

Then,  $31 - 6 = 5 \times x$  or  $5x = 25$  or  $x = 5$

44. At 1 o'clock, the hour hand is at 1 and the minute hand is at 12.

Thus, they are 5 min spaces apart.

To be together, the minute hand must gain 5 min over the hour hand.

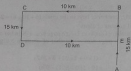
55 min are gained by minute hand in 60 min.

$$5 \text{ min will be gained by it in } \left(\frac{60}{55} \times 5\right) \text{ min} = \frac{60}{11} \text{ min}$$

$$= 5 \frac{5}{11} \text{ min}$$

Hence, the hands will coincide at  $5 \frac{5}{11}$  min past 1.

45. The movement of Lokesh are as shown in figure given below (A to B, B to C, C to D and D to E)



Clearly, his final position is E which is to the North of his house at A.



An year consists of weeks and a week consists of days.



181. Let the number of boys =  $x$

According to question,

$$\frac{25}{100} x^2 = 400$$

$$\Rightarrow x^2 = 1600$$

$$\Rightarrow x = 40$$

82. Let  $x = \sqrt{2 + \sqrt{2 + \dots}}$

$$\Rightarrow x^2 = 2 + x$$

$$\Rightarrow x^2 - x - 2 = 0$$

$$\Rightarrow (x+1)(x-2) = 0$$

$$\Rightarrow x = -1$$

183. Let the number =  $x$

$$\therefore 20 + 2x = 8x - 4$$

$$\Rightarrow 6x = 24$$

$$\Rightarrow x = 4$$

104. Let the three consecutive natural numbers are  $n$ ,  $n + 1$  and  $n + 2$ .

According to question,

$$n^2 + (n + 1)^2 + (n + 2)^2 = 2030$$

$$\text{Or } n^2 + n^2 + 2n + 1 + n^2 + 4n + 4 = 2030$$

$$\text{Or } 3n^2 + 6n - 2025 = 0$$

$$\text{Or } n^2 + 2n - 675 = 0$$

$$\text{Or } (n + 27)(n - 25) = 0$$

$$\text{Or } n = 25 \quad [\because n \neq -27]$$

$$\therefore \text{Middle number} = n + 1 = 25 + 1 = 26$$

105. Let the number be  $x$ .

According to question,

$$\sqrt[3]{x} \times 5 = 25$$

$$\Rightarrow \sqrt[3]{x} = 5$$

$$\Rightarrow x = 5^3$$

106. Marked price of the article = ₹ 75

$$\text{Price after a discount of } 20\% = ₹ \frac{75 \times 80}{100} = ₹ 60$$

Let the rate of another discount =  $x\%$

$$\text{Then, } \frac{60 \times (100 - x)}{100} = 54$$

$$\Rightarrow 100 - x = \frac{5400}{60}$$

$$\Rightarrow 100 - x = 90$$

$$\Rightarrow x = 100 - 90 = 10$$

107. Let the marked price of the article = ₹  $x$

Then,  $88\%$  of  $x = 264$

$$\Rightarrow \frac{x \times 88}{100} = 264$$

$$x = \frac{264 \times 100}{88} = 300$$

Marked price of the article = ₹ 300

188. The SP of the article which is sold at a loss of  $10\%$  = ₹ 72

$$\therefore \text{CP of the article} = \frac{72 \times 100}{90} = ₹ 80$$

Now, SP of the article to get a profit of  $5\%$

$$= 105\% \text{ of } ₹ 80 = \frac{105 \times 80}{100} = ₹ 84$$

109. Let the CP of the article = ₹  $x$

$$\therefore \text{SP of the article} = ₹ \frac{9x}{10}$$

$$\text{New SP of the article} = ₹ \frac{9x}{10} = 9$$

According to question,

$$\frac{x - 225}{200} = \frac{9x}{10} + 9$$

$$\Rightarrow x \left( \frac{225 - 180}{200} \right) = 9$$

$$\Rightarrow x = \frac{9 \times 200}{45}$$

$$\Rightarrow x = 40$$

118. ∴ CP of the cycle = ₹ 1400

$$\therefore \text{SP of the cycle} = \frac{1400 \times 85}{100}$$

$$= ₹ 1190$$

119. Let the CP = ₹ 5x and SP = ₹ 4x

$$\therefore \text{Loss per cent} = \frac{5x - 4x}{5x} \times 100 = 20\%$$

120. Required number =  $\frac{225 \times 5}{25} = 45$

121. LCM of 12, 15, 20 and 54 = 540

$$\therefore \text{Required number} = 540 + 4 = 544$$

122. ∴  $\sqrt{1 - \sqrt{x^4 - x^2}} = x - 1$

$$\text{Or } 1 - \sqrt{x^4 - x^2} = (x - 1)^2$$

$$\text{Or } 1 - \sqrt{x^4 - x^2} = (x^2 - 2x + 1)$$

$$\text{Or } -\sqrt{x^4 - x^2} = (x^2 - 2x)$$

$$\text{Or } x^4 - x^2 = (x^2 - 2x)^2$$

$$\text{Or } x^4 - x^2 = x^4 + 4x^2 - 4x^3$$

$$\text{Or } 4x^3 - x^2 - 4x^2 = 0$$

$$\text{Or } 4x^3 - 5x^2 = 0$$

$$\text{Or } x^2(4x - 5) = 0$$

$$\text{Or } x = 0, \frac{5}{4}$$

123. Let r and h be the radius and height of the cylinder in  $\triangle ABC$ .



$$\sin 30^\circ = \frac{BC}{AC}$$

$$\gamma = 2r$$

$$\text{and } \cos 30^\circ = \frac{AB}{AC}$$

$$\text{Or } \frac{\sqrt{3}}{2} = \frac{x}{4e}$$

$$\text{Or } x = 2\sqrt{3}e$$

$$\therefore 2x = 2\sqrt{3}e$$

$$\text{Or } r = \sqrt{3}e \text{ and } h = 2e$$

∴ Volume of cylinder =  $\pi r^2 h$

$$= \pi \times (\sqrt{3}e)^2 \times 2e$$

$$= 6\pi e^3$$

124. Let the cost price of watch = ₹ x

∴ Selling price of watch to get 10%

$$\text{loss} = \frac{x \times 90}{100} = ₹ \frac{9x}{10}$$

$$\frac{9x}{10} = 630$$

$$\text{Or } x = \frac{630 \times 10}{9} = ₹ 700$$

∴ Selling price of watch to get a profit of 5%

$$= \frac{700 \times 105}{100} = ₹ 735$$

125. Given that,

$$x + \frac{1}{y} = 1$$

$$\text{Or } xy + 1 = y \quad \dots (i)$$

$$\text{and } y + \frac{1}{z} = z + 1 \quad \dots (ii)$$

From Eq. (i),

$$y = \frac{z - 1}{z}$$

On putting this value in Eq. (ii), we get

$$xy + 1 = \frac{z - 1}{z}$$

$$\text{Or } xy + z = z - 1$$

$$\text{Or } xyz = -1$$

126. Let a be the side of square.

$$\therefore a\sqrt{2} = 20$$

$$\Rightarrow a = \frac{20}{\sqrt{2}}$$

$$= 10\sqrt{2} \text{ cm}$$

∴ Perimeter of square

$$= 4 \times a = 4 \times 10\sqrt{2}$$

$$= 40\sqrt{2} \text{ cm}$$

127. Let a and b be the length and breadth of rectangle.

$$\therefore \text{Area of rectangle, } A_1 = a \times b$$

$$\text{New length} = \frac{a}{2} \text{ and new breadth} = 3b$$

$$\therefore \text{Area of rectangle, } A_2 = \frac{3}{2} ab$$

$$\text{Change} = \frac{1}{2} ab$$

$$\text{Per cent change} = \frac{1}{2} \times 100\% = 50\%$$

128. Let the side of one square = x cm

$$\therefore \text{The side of another square} = (x + 2) \text{ cm}$$

According to question,

$$(x + 2)^2 - x^2 = 32$$

$$\Rightarrow (x + 2 - x)(x + 2 + x) = 32$$

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

$$\Rightarrow x = 7$$

$\therefore$  Length of longer side =  $7 + 2 = 9$  cm

121. Let  $P_1 = 40$  cm and  $P_2 = 32$  cm

$$\Rightarrow a_1 = 10 \text{ cm and } a_2 = 8 \text{ cm}$$

$$\therefore A_1 = 100 \text{ cm}^2 \text{ and } A_2 = 64 \text{ cm}^2$$

$$\therefore \text{Area of third square} = 100 - 64 = 36 \text{ cm}^2$$

$$\Rightarrow \text{Side of third square} = 6 \text{ cm}$$

$$\therefore \text{Perimeter of third square} = 4 \times 6 = 24 \text{ cm}$$

122. Let  $a$  be the diagonal of square.

$$\therefore \frac{1}{2} a^2 = 69696$$

$$\Rightarrow a^2 = 2 \times 69696$$

$$\Rightarrow a = 264 \sqrt{2}$$

$$\Rightarrow a = 373.296 \text{ cm}$$

123. Let the breadth of rectangle =  $x$  cm.

$$\therefore \text{The length of rectangle} = (x + 23) \text{ cm}$$

$$\therefore 2(x + 23 + x) = 206$$

$$\Rightarrow 2x + 23 = 103$$

$$\Rightarrow 2x = 80 \Rightarrow x = 40$$

$$\therefore \text{Length of rectangle} = 40 + 23 = 63 \text{ cm}^2$$

$$\text{and breadth of rectangle} = 40 \text{ cm}$$

$$\therefore \text{Area of rectangle} = 63 \times 40 = 2520 \text{ cm}^2$$

124. Using the formula,

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$? = \frac{0.05 \times 0.05 \times 0.05 - 0.04 \times 0.04 \times 0.04}{0.05 + 0.05 \times 0.04 + 0.04 \times 0.04}$$

$$= \frac{(0.05)^3 - (0.04)^3}{(0.05)^2 + 0.05 \times 0.04 + (0.04)^2}$$

$$= 0.05 - 0.04$$

$$= 0.01$$

$$\frac{7}{9} - \frac{1}{3}$$

$$125. ? = \frac{9}{8} - \frac{3}{2}$$

$$\frac{9}{9} - \frac{3}{3}$$

$$\frac{7-3}{8-6} = \frac{4}{2} = \frac{4}{9} \times \frac{9}{2} = 2$$

$$\frac{9}{9} - \frac{3}{9} = \frac{6}{9} = \frac{2}{3}$$

126. Required percentage

$$= \frac{1 \text{ quintal } 25 \text{ kg}}{1 \text{ metric ton}} \times 100\%$$

$$= \frac{125}{1000} \times 100\%$$

$$= 12.5\%$$

127. Let the number of mangoes =  $x$

$$\left(x - \frac{13x}{100}\right) \left(1 - \frac{75}{100}\right) = 261$$

$$\Rightarrow \frac{87}{100} x \times \frac{25}{100} = 261$$

$$\Rightarrow x = \frac{261 \times 100 \times 100}{87 \times 25} = 1200$$

128. Here,  $r_1 = 5\%$  and  $r_2 = 3\%$

$$\therefore \text{Required per cent} = 5 + 3 + \frac{5 \times 3}{100}$$

$$= 8 + 0.15 = 8.15$$

129. Let the maximum marks =  $x$

$$\text{Then, } 35\% \text{ of } x = 650 + 50$$

$$\Rightarrow x = 700 \times \frac{100}{35} = 2000$$

130. When a train crosses a tunnel, it covers a distance equal to the sum of its own length and tunnel.

Let the length of tunnel be  $x$  m.

$$\text{Speed} = 78 \text{ km/h}$$

$$= \frac{78 \times 1000}{60 \times 60} \text{ m/s}$$

$$= \frac{65}{3} \text{ m/s}$$

$$\therefore \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\Rightarrow \frac{65}{3} = \frac{800 + x}{60}$$

$$\Rightarrow (800 + x) \times 3 = 65 \times 60$$

$$\Rightarrow 800 + x = 65 \times 20$$

$$\Rightarrow x = 1300 - 800 = 500$$

$\therefore$  Length of tunnel = 500 m

131. Rate downstream =  $\frac{18}{4} = \frac{9}{2}$  km/h

$$\text{Rate upstream} = \frac{18}{12} = \frac{3}{2} \text{ km/h}$$

Now, speed of the stream

$$= \frac{\text{Rate downstream} - \text{Rate upstream}}{2}$$

$$= \frac{9}{2} - \frac{3}{2} = \frac{6}{2} = 3 \text{ km/h}$$

$$= \frac{2 \times 2}{2} = \frac{6}{4} = \frac{3}{2} = 1.5 \text{ km/h}$$

132. Let the total number of votes be 100.

$$\text{Number of uncast votes} = 8$$

$$\therefore \text{Number of votes polled} = 92$$

$$\text{Number of votes obtained by the winner} = 48$$

$$\therefore \text{Number of votes obtained by the loser} = 48 - 4 = 44$$

$$\text{If the difference of win be 4 votes, total votes} = 100$$

$$\therefore \text{When the difference be 1100 votes, total voters}$$

$$= \frac{100}{4} \times 1100 = 27500$$