

$$\begin{aligned} \therefore A : (x-40) \frac{5}{2} &= (100-40) \frac{5}{2} = \text{Rs. } 150 \\ B : (x-20) \frac{7}{2} &= (100-20) \frac{7}{2} = \text{Rs. } 280 \\ C : (x-10) \frac{17}{9} &= (100-10) \frac{17}{9} = \text{Rs. } 170 \\ & \underline{\hspace{10em}} \\ & \text{Rs. } 600 \end{aligned}$$

27. (a) 28. (e) 29. (d) 30. (d)
 31. (b) 10 articles for Rs. 8 i.e. 80 paise per article sold for Rs. 1.25 per article

$$\begin{aligned} \text{Bought for} &= 80 \text{ paise} \\ \text{gain / article } (1.25 - 0.80) &= 45 \text{ paise} \\ \text{gain percent} &= \frac{45}{80} \times 100 = 56\frac{1}{4}\% \end{aligned}$$

32. (d) Let the cost price be 100.
 Marked price = 10% higher than the cost price

$$\begin{aligned} \text{i.e. } 100 + \frac{10}{100} \times 100 &= 110 \\ \text{Marked price} &= 110 \\ \text{Less: 10\% discount} &= 11 \\ \text{Selling price} &= \underline{99} \end{aligned}$$

Cost price - Selling price = Loss
 $100 - 99 = 1.$

33. (e) 34. (e) 35. (b) 36. (a) 37. (c) 38. (e) 39. (a) 40. (c)

41. (c)
 42. (a) Let the lengths of the rivers A and B be x and y respectively.

$$\begin{aligned} \therefore x + y &= 650; y + 250 = x \text{ (i.e.) } (y+250) + y = 650 \\ 2y &= 400 \Rightarrow y = 200 \end{aligned}$$

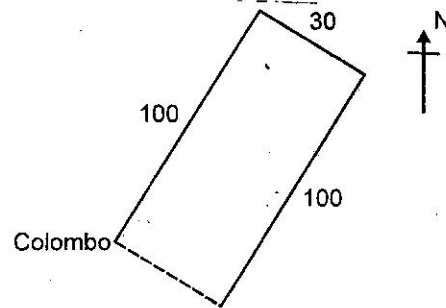
43. (d) Let 'x' be the amount lost by Ram in the first race

$$\begin{aligned} x + (x + 6) &= 68 \\ 2x + 6 &= 68 \\ 2x &= 68 - 6 \\ x &= 31 \text{ (Amount lost in the first race)} \end{aligned}$$

Amount lost in the second race is Rs. 6 more than the first one.
 i.e. Amount lost in the first race + 6 = 31 + 6 = Rs. 37
 Amount lost in the second race by Sham = Amount lost by Ram in the second race + 4
 = 37 + 4 = Rs. 41.

44. (a)
 45. (b) Total age of 33 boys (15.2×33) = 501.60
 Total age of 30 boys (15.1×30) = 453.00
 $\underline{\hspace{10em}}$
 48.60
 Less: New boy's age 16.00
 $\underline{\hspace{10em}}$
 Age of twins 32.60
 $\underline{\hspace{10em}}$
 $\therefore \text{Age of one boy} = \frac{32.60}{2} = 16.30$
 Age of twins 16.3 years.

46. (a) This figure represents the distance and the direction journeyed by the steamer. It can be seen that it is a regular rectangle. The required distance is shown by the dotted line which is parallel to the 30 mile line. Hence this corresponds to 30 miles.



47. (b) 48. (b) 49. (a) 50. (b)
51. (a) Let 'X' be the share given to his son

$$\begin{aligned}
 x + \frac{4x}{7} \text{ (daughter's share)} &= 1,02,300 \\
 \frac{7x + 4x}{7} &= 1,02,300 \\
 11x &= 1,02,300 \times 7 = 7,16,100 \\
 \text{(Son's share) } x &= 65,100 \\
 \text{Wife's share equals} &= \frac{6}{7} \text{ th of son's share} \\
 &= 65,100 \times \frac{6}{7} = \text{Rs. } 55,800
 \end{aligned}$$

52. (c) 53. (b) 54. (b)

55. (a) A vessel contains 180 litres of wine. 60 litres are taken out every day
I day

180 litres 60 litres are taken out
Remaining 120 litres wine.

II day

$$\begin{aligned}
 \frac{60}{180} \times 120 &= 40 \text{ litres} \rightarrow \text{taken out} \\
 \text{Balance} &= 80 \text{ litres (120 - 40)}
 \end{aligned}$$

III day

$$\begin{aligned}
 \frac{60}{180} \times 80 &= 26\frac{2}{3} \text{ litres} \rightarrow \text{taken out} \\
 \text{Balance} &= 80 - 26\frac{2}{3} = 53\frac{1}{3} \text{ ltrs.}
 \end{aligned}$$

Quantity of wine remains at the end of three days = $53\frac{1}{3}$ ltrs.

56. (b) If the present value is Rs. 100

$$\begin{aligned}
 \text{The interest in 5 yrs at 5\%} &= \frac{100 \times 5 \times 5}{100} = 25 \\
 \text{(Amount) The value at the end of 5 years} &= 125.
 \end{aligned}$$

Amount		Present worth
125	-	100
10000	-	$\frac{100}{125} \times 10000 = \text{Rs. } 8,000$

57. (b) 58. (b)

59. (d) Relative speed = $50 - 30 = 20$ miles 1 hour

It is given that it takes 15 minutes for the faster to catch the slower one.

Thus it will travel 5 miles in 15 minutes to catch the slower train.

Thus 5 miles is the distance between faster and slower train.

60. (a) 61. (a)

62. (b) Let 'x' be the no. of rabbits and 'y' be the no. of pigeons
Total no. of pigeons & rabbits 20

$$\begin{aligned} x + y &= 20 && \dots (1) \\ x \times 4 + y \times 2 &= 48 && \dots (2) \end{aligned}$$

Multiply (1) by 4 and subtract (2) from (1)

$$\begin{array}{r} 4x + 4y = 80 \\ 4x + 2y = 48 \\ \hline 2y = 32 \\ y = 16 \\ \text{No. of pigeons} = 16 \end{array}$$

63. (c) Let cigarettes be x and men be y.

1 man gets $\frac{x}{4}$ cigarettes.

other (y - 1) men get $\frac{3x}{4}$ cigarettes

each gets $\frac{3x/4}{y-1}$

1 man gets 3 times the others'

$$\frac{x}{4} = \frac{3 \times \frac{3x}{4}}{y-1}$$

$$\frac{x}{4} = \frac{9x}{4(y-1)}$$

$$4(y-1) \times x = 9 \times 4 \times x$$

$$y-1 = 9$$

$$y = 9 + 1 = 10.$$

64. (b) 65. (c) 66. (b) (Hint: The cyclists meet after 1 hour. So the fly travels for 1 hour)

67. (b)

$$\begin{aligned} \text{68. (c) No. of boxes} &= 1 + 4 + 4 \times 3 + 12 \times 2 \\ &= 1 + 4 + 12 + 24 \\ &= 41. \end{aligned}$$

69. (d)

70. (a)

71. (b)

72. (c) Let 'x' be his present age

$$\begin{aligned} x + 20 &= 3x &\Rightarrow & 20 = 3x - x \\ 2x &= 20 &\Rightarrow & x = 10 \end{aligned}$$

His present age is 10 years.

73. (b) $l = 2b$ and area = 4050 (given)

$$\therefore \text{length} \times \text{breadth} = 2b \times b = 2b^2 = 4050$$

$$\therefore b^2 = 2025 \Rightarrow b = 45 \text{ and } l = 90$$

$$\text{Perimeter} = 2(l+b)$$

$$2(90 + 45) = 2(135) = 270$$

$$\text{The cost of fencing @ Rs. 2.5/m} = 270 \times 2.5 = \text{Rs. 675/-}$$

74. (e)

75. (d) A - 10% more than B or 15% less than C

B - Rs. 85

$$\text{A's earning} = 85 + 10\% \text{ of } 85 = 93.5$$

$$\text{C's earning} = \frac{93.5}{85} \times 100 = 110$$

76. (e)

77. (e)

$$78. (b) A : B : C : 1\frac{1}{2} : 3\frac{1}{3} : 2\frac{3}{4} \text{ or } \frac{3}{2} : \frac{10}{3} : \frac{11}{4}$$

$$A : B : C = 18 : 40 : 33 \text{ (sum of the ratio } 18 + 40 + 33 = 91)$$

$$B's \text{ share} = 91 \times \frac{40}{91} = \text{Rs. } 40$$

79. (c) 80. (b) 81. (c) 82. (a)

83. (e) Sum of $\frac{1}{4}$ and $\frac{1}{5}$ = $\frac{1}{4} + \frac{1}{5} = \frac{5+4}{20}$

$$1 - \left[\frac{1}{4} + \frac{1}{5} \right] = 1 - \frac{9}{20}$$

$$\frac{20-9}{20} = \frac{11}{20} \text{ (or) } 0.55$$

His result was

$$\therefore 0.55 - 0.45 = 0.10$$

$$\therefore \% \text{ of error} = \frac{0.10}{\frac{11}{20}} \times 100 \text{ (or) } \frac{10 \times 20}{11} = \frac{200}{11} \%$$

84. (a) Let 'x' be the number

$$\frac{75x}{100} + 75 = x$$

$$\frac{75x + 7500}{100} = x$$

$$100x - 75x = 7500$$

$$25x = 7500$$

$$\text{(The number is) } x = 300$$

85. (d) 86. (a) 87. (d) 88. (c) 89. (c)

90. (a) Let 'x' be the cost of chair

Let 'y' be the cost of table

$$16x = 7y \text{ (or) } 16x - 7y = 0 \quad \dots(1)$$

$$5x + 2y = \text{Rs. } 335 \quad \dots(2)$$

Multiply (1) and (2) by 5 and 16 respectively

$$80x - 35y = 0$$

$$80x + 32y = 5360$$

$$-67y = -5360 \Rightarrow y = \text{Rs. } 80$$

Substitute this value in (2)

$$5x + 2y = \text{Rs. } 335$$

$$5x + 2 \times 80 = 335$$

$$5x = 335 - 160 = 175$$

$$x = 175/5 = \text{Rs. } 35$$

$$\text{Cost of Chair} = \text{Rs. } 35$$

91. (d) 92. (b) 93. (e)

94. (a) The value of $1502^2 - 1498^2$

$$\text{Since } (a^2 - b^2) = (a + b)(a - b)$$

$$1502^2 - 1498^2 = (1502 + 1498)(1502 - 1498)$$

$$= 3000 \times 4 = 12000$$

95. (e) 96. (c) 97. (a) 98. (d) 99. (b) 100. (d) 101. (d) 102. (c)

103. (c) 104. (c) 105. (e) 106. (c) 107. (c) 108. (d) 109. (e)

110. (c) Let 'x' be the share of B

$$A + B + C's \text{ share} = \text{Rs. } 1,080$$

$$(x - 120) + x + (x - 120 + 60) = 1080$$

$$\begin{aligned}
 x - 120 + x + x - 60 &= 1080 \\
 3x - 180 &= 1080 \Rightarrow 3x = 1080 + 180 \\
 x &= \frac{1260}{3} = 420 \therefore \text{B's share} = \text{Rs. } 420
 \end{aligned}$$

111. (d) 112. (d)

113. (b) Let the value of wealth be 'x'

$$\begin{aligned}
 \text{Wife's share} &= \frac{1}{2}x \\
 \text{Balance} &= \frac{1}{2} \text{ (i.e. } 1 - \frac{1}{2} \text{)} \\
 \text{Son's share} &= \frac{1}{2} \times \frac{4}{5} = \frac{4}{10} \\
 \text{Balance} &= \frac{1}{2} - \frac{4}{10} = \frac{5-4}{10} = \frac{1}{10} \\
 \text{Daughter's share} &= \frac{2}{3} \times \frac{1}{10} = \frac{2}{30} \\
 \text{Balance} &= \frac{1}{10} - \frac{2}{30} = \frac{3-2}{30} = \frac{1}{30}
 \end{aligned}$$

Balance $\frac{1}{30}$ is for endowment which received Rs. 1000

$$\therefore \text{Total wealth} = \frac{1000}{\frac{1}{30}} \times 30 = \text{Rs. } 30000$$

114. (a) 115. (b) 116. (b) 117. (d)

118. (c) Let the no. of birds in the first collection be x

$$\begin{aligned}
 x + x + \frac{1}{2}x + \frac{1}{2} \times \frac{x}{2} + 1 &= 100 \\
 \frac{4x + 4x + 2x + x + 4}{4} &= 100 \\
 11x + 4 &= 400 \\
 11x &= 400 - 4 = 396 \\
 x &= \frac{396}{11} = 36
 \end{aligned}$$

Number of birds in the first collection is 36.

119. (e) Ratio G : C = 19 : 9

Ratio of metals taken = 1 : x \therefore 1 cc of gold = 1 gm

x cc of copper = 9x gm

Total weight of (1+x) cc = 19 + 9x

Weight of 1 cc of the alloy

Weight (4x) cc alloy 15(x+1)

$$\therefore 19 + 9x = 15(x+1)$$

$$4 = 6x \Rightarrow x = \frac{2}{3}$$

$$1 : x = 3 : 2$$

120. (a) 121. (c) 122. (d) 123. (c) 124. (c) 125. (c) 126. (d) 127. (c)

128. (d) A chair & a table together cost Rs. 100

Let the cost of the table be x

$$(x - 16) + x = \text{Rs. } 100 \Rightarrow 2x - 16 = 100$$

$$2x = 100 + 16 = 116$$

$$\text{(Cost of the table) } x = \frac{116}{2} = \text{Rs. } 58$$

129. (b)

130. (d) Let the number of 10 paise coins be x

$$\begin{aligned}x \times 0.10 + 3x \times 0.20 &= \text{Rs. } 21 \\0.1x + 0.6x &= \text{Rs. } 21 \\0.7x &= \text{Rs. } 21 \\(\text{No. of 10 paise coins}) x &= \frac{21}{0.7} = 30 \\20 \text{ paise coins are thrice the number of 10 paise coins} \\30 \times 3 &= 90 \\ \text{No. of 20 paise coins} &= 90\end{aligned}$$

131. (a) 132. (b) 133. (d) 134. (c)

135. (c) Let the number be 'x'

$$\begin{aligned}\frac{90x}{100} &= x - 90 \\90x &= 100x - 9000 \\90x - 100x &= -9000 \\-10x &= -9000 \\(\text{P is equal to}) x &= 900\end{aligned}$$

136. (c) 137. (b) 138. (c) 139. (a) 140. (e) 141. (c) 142. (b) 143. (b)

144. (d) 145. (c) 146. (d) 147. (c)

148. (b) $P : 7 = 12 : 21$
on $P \times 21 = 7 \times 12$ (Product of the end terms)
 $=$ Product of the middle terms $= P$ equals 4

149. (b) The series can be written as 1, 1+2, 1+2+3,

The n th term is $T_n = 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$

\therefore the 16th term $T_{16} = \frac{16 \times 17}{2} = 136$

150. (b) 151. (d) Hint: $\pi d = 66$ 152. (a) 153. (d) 154. (a)

155. (c) From the problem,
Rama's age = n years
Rama's brother age = $n + 5$ years
 \therefore Before seven years
Rama's brother age = $n + 5 - 7$ years = $n - 2$ years

156. (b) From the problem
 $l = 2b$ (l = length ; b = breadth)
(Perimeter = $2l + 2b$, if l & b are length & breadth respectively)
 \therefore Perimeter = $2(2b) + 2b = 6b$

157. (a)

158. (c) $\sqrt{x} = 17 \Rightarrow \therefore x = 17^2 = 289$
 $3x + 21 = 3(289) + 21$
 $= 867 + 21 = 888$

159. (c)

160. (c) 1st Rs.25 earns interest for 24 months, 2nd one - 23 months and so on.
 \therefore Rs. 25 gets interest for $24 + 23 + \dots + 1$ months = $\frac{24 \times 25}{2 \times 12} = 25$ years.

161. (a) $324^2 - (324 \times 124) = 324 [324 - 124]$
 $= 324 [200] = 64,800$

162. (b) Let x be the required number, then by data

$$\begin{aligned}\frac{5(x+7)}{9} - 3 &= 12 \Rightarrow \frac{5x+35-27}{9} = 12 \\ 5x+8 &= 108 \Rightarrow 5x = 100 \\ x &= 20\end{aligned}$$

163. (c) From the Ave.

$$\begin{aligned}40 \text{ m. of muslin} + \text{Rs. } 60 &= 36 \times 5 \quad (\text{Since } 36 \text{ m. of silk cost} = 36 \times 5) \\ 40 \text{ m. of muslin} &= 180 - 60 \\ 40 \text{ m. of muslin} &= \text{Rs. } 120 \\ \therefore 1 \text{ m of muslin} &= \text{Rs. } 3\end{aligned}$$

164. (d) Hint : Take x as the number of apples she had first.

Then she gave first customer $\frac{x}{2} + \frac{1}{2}$ apples

whereas to the second customer she gave $\frac{x-1}{2} + \frac{1}{2}$

Note : In case of 4 distributions like this, the answer is $16a + 15$ where a is the finally remaining number.

165. (b) 166. (a) 167. (a) 168. (b) 169. (c) 170. (c) 171. (b) 172. (c)

173. (b) 174. (c) 175. (e)

176. (d) You can buy with any one note : 4 articles ($4C_1$)

with any 2 notes 6 ($4C_2$)

with any 3 notes 4 ($4C_3$)

with all the notes = 1 ($4C_4$)

$$\text{Total : } 4 + 6 + 4 + 1 = 15$$

177. (d) 178. (d) 179. (d) 180. (c)

181. (b) Hint : Use the following result

If l & b are length and breadth of a rectangle, then area = lb

When a path of uniform width (say) w units (frame) surrounds the rectangle on the outside, then, area of the new rectangle = $(l + 2w)(b + 2w)$

[\therefore Area of path (frame) = Area of outer rectangle - Area of inner rectangle]

182. (d) 1st day : $+\frac{3}{8}$; II day : $-\frac{1}{2}$

If 'R' be the increase on the 3rd day

$$\text{total increase} = \frac{3}{8} - \frac{1}{2} + R = 3 \times \text{given average} = 3 \times \frac{1}{8}$$

$$\therefore R = \frac{1}{2}$$

183. (a)

184. (d) Use the formula : Volume of cylinder = $\pi r^2 h$

Here $r = 2$ inches (\therefore diameter = 4 inches) $h = 14$ inches

$$\therefore \text{volume} = \frac{22}{7} \times 2^2 \times 14 \quad (\text{since } \pi = \frac{22}{7})$$

$$= 22 \times 4 \times 2 = 176 \text{ cubic inches.}$$

In 10 min the volume filled = 8 cu. in.

$$\therefore \text{In 1 min the volume filled} = \frac{8}{10} \text{ cu. in} = \frac{4}{5} \text{ cu. in.}$$

$$\text{Now, the time (in minutes) required to fill 176 cu. in.} = \frac{176 \cdot}{4/5} = \frac{176 \times 5}{4} = 220 \text{ min.}$$

(i.e.) 3 hrs and 40 min.

\(\therefore\) It begins to overflow at (10.00 hrs + 3 hrs.40 min.) = 1.40 p.m.

185. (c) 186. (a) 187. (c)

188. (b) From the problem,

$$\frac{l}{b} = \frac{5}{3} \text{ Also } lb = 1500 \Rightarrow 3l - 5b = 0 ; b = \frac{1500}{l}$$

$$3l - \frac{5 \times 1500}{l} = 0 \Rightarrow 3l^2 = 7500$$

$$l^2 = \frac{7500}{3} = 2500 = (50)^2$$

$$\therefore l = 50$$

$$\therefore b = \frac{1500}{50} = 30$$

fencing of field (Perimeter)

$$= 2l + 2b$$

$$= 2(50) + 2(30)$$

$$= 100 + 60 = 160 \text{ mts}$$

\(\therefore\) Cost of fencing = Rs.160 (\(\because\) 1m fencing costs Re.1)

189. (a) 190. (a)

191. (b) **Hint :** Circumference of a circle = $2\pi r$

Area of circle = πr^2 where r is the radius

192. (d) **Use :** Volume of cube = lbh (length = l ; breadth = b ; height = h)

193. (c) 194. (c) 195. (a) 196. (c)

197. (c) **Use :** gain% = $\frac{\text{Gain} \times 100}{\text{C.P.}}$ (Gain = S.P. - C.P.; C.P. = Cost Price, S.P. = Selling Price)

here C.P. = Rs. $87\frac{1}{2}$

198. (e) Loss = Cost Price - Selling Price

$$\text{Loss\%} = \frac{\text{Loss} \times 100}{\text{C.P.}} \text{ where C.P.} = 111\frac{1}{9}, 90\frac{10}{11} \text{ and S.P.} = 100 + 100$$

199. (a)

200. (c)

$$3.50 \swarrow$$

$$3.20 \swarrow$$

$$0.10 \swarrow$$

$$0.20 \swarrow$$

\(\therefore\) Ratio 1 : 2

