

$$\therefore \text{Curved surface area} = \frac{22}{7} \times 0.7 \times 4.2$$

$$= 2.2 \times 4.2 = 9.24 \text{ cm}^2$$

157. Slant height is l

$$l^2 = r^2 + h^2$$

$$= (10.5)^2 + (14)^2$$

$$= 110.25 + 196 = 306.25$$

$$l = \sqrt{306.25} = 17.5 \text{ cm.}$$

158. The curved surface area of the cone = $\pi r l$ square units.

$$= \frac{22}{7} \times 4.9 \times 14 \text{ cm}^2 = 215.6 \text{ cm}^2$$

159. Volume of hemisphere = $\frac{2}{3} \pi r^3$

$$= \frac{2}{3} \times \frac{22}{7} \times 10.5 \times 10.5 \times 10.5 \text{ dm}^3$$

$$= \frac{50935.5}{21} = 2425.5 \text{ dm}^3 = 2425.5 \text{ litres.}$$

160. C.S.A of hemisphere = $2\pi r^2$ square units.

$$= 2 \times \frac{22}{7} \times 1.75 \times 1.75 \text{ cm}^2 = \frac{134.75}{7}$$

$$= 19.25 \text{ cm}^2$$

161. T.S.A of hemisphere = $3\pi r^2$ square units.

$$= 3 \times \frac{22}{7} \times 10 \times 10 \text{ cm}^2 = \frac{6600}{7} = 942.86 \text{ cm}^2$$

162. Surface area of a sphere = $4\pi r^2$ square units.

$$= 4 \times \frac{22}{7} \times 21 \times 21 = 4 \times 22 \times 3 \times 21 = 5544 \text{ cm}^2$$

163. Volume = $\frac{4}{3} \pi r^3$. If the r value is given, volume can be calculated directly and there is no need to apply the total surface area, to find the radius.

$$\text{Volume} = \frac{4}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 3.5$$

$$= \frac{539}{3} = 179.67 \text{ cm}^3$$

164. It is known that slant height is l

$$l^2 = r^2 + h^2 \therefore h^2 = l^2 - r^2; h = \sqrt{l^2 - r^2}$$

$$165. 0.00452 = \frac{452}{100000} = \frac{4.52 \times 100}{100000} = 4.52 \times 10^{-3}$$

166. When a number is given in scientific notation it is said to be in standard form, i.e., ready for use in logarithmic calculation.

$$4783 = 4.783 \times 1000 = 4.783 \times 10^3$$

167. As per product rule $a^m \times a^n = a^{m+n}$

$$\therefore x^4 \times x^3 = x^{4+3} = x^7$$

168. As per quotient rule $\frac{a^m}{a^n} = a^{m-n}$

$$\text{here } m = 7 \text{ and } n = 1 \therefore 7 - 1 = 6.$$

$$169. ? \% \text{ of } \frac{5}{8} = \frac{8}{5} \Rightarrow ? = \frac{8}{5} \times \frac{100}{1} \times \frac{8}{5} = 256$$

$$170. 2.3 + 6.5 - 7.1 + 4.9 - 1.4 + 8.6 - 5.3 = ? = 8.5$$

$$171. \frac{4}{5} \div \frac{3}{4} \times \frac{1}{3} + \frac{2}{3} \div \frac{3}{5} \times \frac{5}{4} = ?$$

$$= \frac{4}{5} \times \frac{4}{3} \times \frac{1}{3} + \frac{2}{3} \times \frac{5}{3} \times \frac{5}{4}$$

$$\therefore ? = \frac{16}{45} + \frac{25}{18} = \frac{32 + 125}{90} = \frac{157}{90}$$

172. 91% of 380 + 44% of 220 = ?

$$= 345.8 + 96.8 = 442.6$$

173. $3.85 \times 5.45 + 4.65 = ?$

$$= 20.9825 + 4.65 = 25.6325$$

174. ? of ? = 46.24

$$\Rightarrow ?^2 = 46.24 \Rightarrow ? = \sqrt{46.24} = 6.8$$

$$175. 3\frac{1}{8} \times 6\frac{2}{7} \div 5\frac{3}{5} \times 2\frac{4}{5} = ? = \frac{25}{8} \times \frac{44}{7} \times \frac{5}{28} \times \frac{14}{5}$$

$$= \frac{275}{28} = 9\frac{23}{28}$$

$$176. \frac{11}{5} - \frac{7}{8} + \frac{4}{9} - \frac{5}{6} = ?$$

$$= \frac{72 \times 11 - 45 \times 7 + 40 \times 4 - 60 \times 5}{360} = \frac{337}{360}$$

$$177. 1 + ? = \frac{14}{15} + \frac{3}{5} = \frac{23}{15} = 1 + \frac{8}{15} \Rightarrow ? = \frac{8}{15}$$

178. $625 \times 318 - 412 \times 156 = ?$

$$= 198750 - 64272 = 134478$$

187. Rs. 330 - Rs. 300 = Rs. 30

$$\text{i.e. } \frac{30}{300} \times 100 = \text{Rs. } 10$$

$$\therefore \frac{300}{10} \times 100 = \text{Rs. } 3,000$$

188. 10 articles for Rs. 8; i.e. 80 paise per article sold for Rs. 1.25; per article bought for = 80 paise

Gain / article $(1.25 - 0.80) = 45$ paise

Gain percent = $\frac{45}{80} \times 100 = 56\frac{1}{4}\%$

189. $12\frac{1}{2}\%$ is $\frac{1}{8}$

\therefore Selling Price of milk = Rs. 4.80 + Rs. 0.60
= Rs. 5.40

New Rate Selling Price

$\frac{16 \text{ (Old Quantity)}}{20 \text{ (New Quantity)}} \times \text{Rs. } 5.40$

= $\frac{4}{5} \times 5.40 = \text{Rs. } 4.32 \text{ per litre.}$

192. River A & River B \rightarrow Length = 650 miles

Let 'X' be the length of River A. River B is 250 less than River A

$$x + x - 250 = 650$$

$$2x = 650 + 250$$

$$x = \frac{900}{2} = 450$$

Length of River A = 450 miles

Length of River B = $650 - 450 = 200$ miles

193. $847 - 770 = 77$

$770 - 77$

$100 - 10\%$

195. Men holes days

20 40 60

10 ↓ 20 ↑ ?

$\frac{20}{10} \times \frac{20}{40} \times 60 = 60$ days.

197. Let the breadth be x; length = 2x;

Area = $2x \times x = 2x^2$

$2x^2 = 4050 \Rightarrow x^2 = 2025 \therefore x = 45$ mtr.

Perimeter = $2(l + b) = 2(2x + x) = 6x = 270$

Total cost of fencing = $270 \times \text{Rs. } 2.50$
= **Rs. 675**

198. A : B : C : $1\frac{1}{2} : 3\frac{1}{3} : 2\frac{3}{4}$ or

$\frac{3}{2} : \frac{10}{3} : \frac{11}{4} = \frac{18 : 40 : 33}{12}$

A : B : C = 18 : 40 : 33

(sum of the ratio $18 + 40 + 33 = 91$)

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

199. $A = 180 - 130 = 50^\circ$

But $A = C$ (given)

$\therefore B = 130^\circ - 50^\circ = 80^\circ$

200. Ignore zeros and reduce to old 4 and new 1 ($20,000 : 5000 = 4 : 1$). After 10 days food is available for 20 days for 4 at full ration.

For 5 at $\frac{1}{2}$ ration, the food will be sufficient

for $\frac{4 \times 20 \times 2}{5} = 32$ days.

201. $\frac{8+4}{5-2}$ times $5 : 2 = \frac{12}{3}$ times = 4 times

Length = $4 \times 5 = 20$ M,

Breadth = $4 \times 2 = 8$ M.

202. Suppose one part is = Rs. x

\therefore Other part = Rs. $(1440 - x)$

By hypothesis,

$1440 - x = \frac{7}{9}x$ or $12960 - 9x = 7x$

or $16x = 12960 \therefore x = 810$

Hence, the smaller part = Rs. $(1440 - 810)$

= **Rs. 630**

203. Suppose C.P. of article = Rs. x Loss = 29 %

\therefore C.P. of article = Rs. $x \times \frac{100 - 29}{100}$

= Rs. $x \frac{71}{100}$

If the article was sold for Rs. 84 more,

New S.P. = Rs. $\left(\frac{71}{100}x + 84\right)$

Then, profit % = $\frac{\frac{71}{100}x + 84 - x}{x} \times 100$

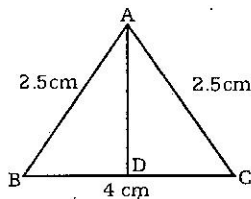
By hypothesis,

$\frac{8400 - 29x}{100x} \times 100 = 11$

or $8400 - 29x = 11x$ or $40x = 8400$

or $x = \text{Rs. } 210$

204. Clearly ABC is an isosceles triangle.
Since AD must be right bisector of BC



- $\therefore BD = DC = \frac{1}{2}(4) = 2 \text{ cm}$
 \therefore From right angled $\triangle ADB$,
 $AB^2 = BD^2 + AD^2$
 or $AD^2 = AB^2 - BD^2 = (2.5)^2 - 2^2 = 6.25 - 4 = 2.25$
 $\therefore AD = \sqrt{2.25} = \sqrt{(1.5)^2} = 1.5 \text{ cm.}$

205. Suppose cost of one table = Rs. x

\therefore Cost of 2 chairs = Rs. x

\therefore Cost of 1 chair = Rs. $\frac{x}{2}$

By hypothesis,

$$5\left(\frac{x}{2}\right) + 2x = 1350$$

or $5x + 4x = 2700$ or $9x = 2700$;

$\therefore x = 300$

Hence, total price of one chair and one table

$$= \text{Rs.} \left(\frac{x}{2} + x\right) = \text{Rs.} \frac{3}{2}x = \text{Rs.} \frac{3}{2} \times 300 = \text{Rs.} 450$$

206. Average of 6 numbers = 8

\therefore Total of 6 numbers = $6 \times 8 = 48$. If the required number is x, then,

$$\frac{48 + x}{6 + 1} = 9 \text{ or } 48 + x = 63 \text{ or } x = 63 - 48 = 15$$

207. The required no. = $\frac{7700 \times 1}{275} = 308$

208. The total cost price of 125 shirts = 11250 + 375 = Rs. 11625

\therefore The total selling price of 125 shirts

$$= \frac{120 \times 11625}{100} = \text{Rs.} 13950$$

\therefore Selling price of one shirt

$$= \frac{13950}{125} = \text{Rs.} 111.60$$

209. The required percentage =

$$\frac{40}{1200} \times 100 = \frac{10}{3} = 3 \frac{1}{3}$$

213. Total age of 33 boys $(15.2 \times 33) = 501.60$
 Total age of 30 boys $(15.1 \times 30) = 453.00$

$$\underline{48.60}$$

LESS : New boy's age

$$\underline{16.00}$$

Age of twins

$$\underline{32.60}$$

$$\therefore \text{Age of one boy} = \frac{32.60}{2}$$

$$= 16.30$$

Age of twins 16.3 years

214. Let 'X' be the share given to his son

$$x + \frac{4x}{7} \text{ (daughter's share)} = 1,02,300$$

$$\frac{7x + 4x}{7} = 1,02,300$$

$$11x = 1,02,300 \times 7$$

$$= 7,16,100$$

$$\text{(Son's share) } x = 65,100$$

$$\text{Wife's share} = \frac{6}{7} \text{ th of share}$$

given to his son

$$= 65,100 \times \frac{6}{7}$$

$$= \text{Rs.} 55,800$$

$$215. \frac{60,000 - 3,600}{100} = 564$$

$$216. \frac{3}{2} + \frac{11}{4} + \frac{35}{8} = \frac{12 + 22 + 35}{8} = \frac{69}{8} = 8 \frac{5}{8}$$

217. A - 10% more than B or 15% less than C
 B - Rs. 85

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

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

218. Let 'B' get 'x'

\therefore A's share is $x + 59$

C's share is $x + 59 + 53 = x + 112$

$$x + x + 59 + x + 112 = 600$$

$$3x = 600 - 171 = 429$$

$$x = 143$$

\therefore A gets $143 + 59 = 2.02$

220. A chair and a table together cost Rs. 100

Let the cost of the table be x

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

$$2x - 16 = 100$$

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

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

221. Let the number of 10 paise coins be x

$$x \times 0.10 + 3x \times 0.20 = \text{Rs. } 21$$

$$0.1x + 0.6x = \text{Rs. } 21$$

$$0.7x = \text{Rs. } 21$$

$$\text{(No. of 10 paise coins) } x = \frac{21}{0.7} = 30$$

20 paise coins are thrice (the number of 10 paise coins) $30 \times 3 = 90$

No. of 20 paise coins = 90

223. $\frac{\text{Original Quantity} + 50\% \text{ of Original Quantity}}{\text{Total Quantity}} \times \text{C.P. per litre}$

$$= \frac{10 + 50\% \text{ of } 10 \times 4}{10 + 6} = \frac{15 \times 4}{16} = \text{Rs. } 3.75$$

$$224. \frac{5(x+7)}{9} - 3 = 12$$

$$\frac{5x+35-27}{9} = 12$$

$$5x + 8 = 108$$

$$5x = 100$$

$$x = 20$$

$$225. \frac{12 \times 15}{12 + 15} = \frac{180}{27} = \frac{60}{9} = 6\frac{2}{3} \text{ days.}$$

226. $\frac{6 \times 10 \times 12}{(6 \times 10) + (10 \times 12) + (12 + 6)}$ multiply by 2

$$= \frac{720 \times 2}{60 + 120 + 72} = \frac{720 \times 2}{252} = 5\frac{5}{7}$$

\therefore A alone can do the work in

$$\frac{3}{1} \times \frac{10 \times 4}{10 - 4} = \frac{120}{6} = 20 \text{ days}$$

Of course, B, alone can do the work in

$$10 \times \frac{3}{1} = 30 \text{ days}$$

$$227. 2\frac{1}{2}\% \text{ of } 500 = 40\% \text{ of ?}$$

$$= \frac{2.5 \times 500}{40} = 31.25$$

228. We have (i) $(7 \div 8) = 0.8750$,

(ii) $(7 \div 9) = 0.7777 \dots$,

(iii) $(8 \div 9) = 0.8888 \dots$,

(iv) $(6 \div 7) = 0.8571 \dots$

(v) $(9 \div 11) = 0.8181 \dots$ Obviously,

$(8 \div 9)$ is the largest in value.

$$229. ?^2 + \frac{13}{5} = 2\frac{19}{25} \Rightarrow ?^2 = 2.76 - 2.60 = 0.16$$

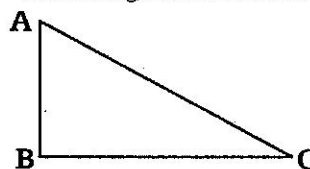
$$\therefore ? = \sqrt{0.16} = 0.4 = 2 \div 5$$

230. 20% of 75% of ? = 72.75 = $0.15 \times ?$

$$\therefore ? = 72.75 \div 0.15 = 485$$

231. $6029 - 1457 - 2628 + 437 - 59 = ? = 2322$

232. See the figure drawn below:-



$l(BC) = 36 \text{ cm}$, $l(AC) = 60 \text{ cm}$.

$l(AB) + l(BC) + l(AC) = 144 \text{ cm} \dots$ Given

$$\therefore l(AB) = 144 - 60 - 36 = 48 \text{ cms.}$$

Area of the triangle

$$= \frac{1}{2} \times l(BC) \times l(AB) = \frac{1}{2} \times 36 \times 48$$

$$= 864 \text{ sq. cm}$$

233. In performing $(823)^{579}$, observe that the digit at unit's place viz. "3" would get multiplied by itself 579 times. Now, when "3" gets multiplied by itself successively, we get the group of digits "3,9,7,1" repeating themselves.

Thus, $(579 \div 4) \Rightarrow 144$ as the quotient and 3 as the remainder. Thus, out of the above group of digits, the digit at 3rd place would be the answer.

234. The sequence of whole numbers starts from zero. Thus, upto (and including) 100, we can see that the digit "zero" appears 12 times. (0, 10, 20, 40, 50, 60, 70, 80, 90 and 100).

235. Let the amounts with A and B be Rs. (3X) and Rs. (5X) respectively.

Thus, (2X) = Rs.314 \Rightarrow X = Rs.157.

Hence, the required sum = (3X) + (5X) = (8X) = (8 \times 157) = **Rs.1256**

236. Cost price for 11 articles = Rs.10(I)

Sales price for 10 articles = Rs.11(II)

Sales price for 11 articles = Rs.12.1(III)

Thus, required profit = $\frac{12.1 - 10}{10} \times 100\% = 21\%$

237. L.C.M of 3, 6 and 7 is 42. Multiply each ratio by 42, we get 14 : 7 : 6

\therefore First part is = $\frac{14}{14+7+6} \times 81 = \frac{14}{27} \times 81 = 42$

$$238. \frac{4}{\sqrt{0.000625}} = \frac{4}{\sqrt{\frac{625}{1000000}}}$$

$$= \frac{4}{\frac{25}{1000}} = 4 \times \frac{1000}{25} = \frac{4000}{25} = 160$$

239. The product of means is equal to product of extremes.

$\therefore 6 \times 32 = 24 \times x; 192 = 24x;$

$\therefore x = \frac{192}{24} = 8$

240. By using the formula

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

Here a = 85; b = 25; a - b = 85 - 25 = 60

241. Let the number be x;

From the problem x = 75 + 75% of x

i.e., x = 75 + $\frac{75}{100}$ x;

i.e., x = 75 + $\frac{3}{4}$ x

75 = x - $\frac{3}{4}$ x = $\frac{1}{4}$ x; 75 = $\frac{1}{4}$ x

$\therefore x = 300$

242. The factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24;

The factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30.

Their common factors are 1, 2, 3, 6;

The greatest is 6. Hence H.C.F. of 24 and 36 is 6.

243. The factors of 6 are 2 \times 3

8 are 2 \times 2 \times 2

10 are 2 \times 5

L.C.M (Least Common Multiple) is $2^3 \times 3 \times 5 = 120$

$$244. \frac{45}{100} \times x + \frac{30}{100} \times 90 = \frac{30}{100} \times 210$$

By simplifying, 9 over 20 \times x + 27 = 63;

$$\frac{9x + 540}{20} = 63 \text{ or } 9x + 540 = 1260$$

$$9x = 1260 - 540 = 720;$$

$$x = \frac{720}{9} = 80$$

245. Rs. 330 - 300 = Rs. 30

i.e., $\frac{30}{300} = 100$ which is 10%;

$$\therefore \frac{300}{10} \times 100 = 3000$$

$$246. C.I. = P \left[\left(1 + \frac{r}{100} \right)^n - 1 \right]$$

$$= 5000 \left[\left(1 + \frac{4}{100} \right) \left(1 + \frac{4}{100} \right) - 1 \right]$$

$$= 5000 \left[\left(\frac{26}{25} \right) \left(\frac{26}{25} \right) - 1 \right]$$

$$= 5000 \times \frac{676}{625} - 1$$

$$= 5000 \times \left(1 \frac{51}{625} - 1 \right) = \frac{5000 \times 51}{625} = \text{Rs. 408}$$

248. Let 'x' be the share of B

$$A + B + C's \text{ share} = 1080$$

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

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

$$3x - 180 = 1080$$

$$3x = 1080 + 180$$

$$x = \frac{1260}{3} = 420$$

B's share = **Rs. 420**

249. $4 \times 10 - 4 \times 8 = 8$. The Aggregate of last four is more and the last number is $8 + 4 = 12$.

$$250. \frac{(27)^{n/3} \times (8)^{-n/6}}{(162)^{-n/2}} = \frac{(3^3)^{n/3} \times (2^3)^{-n/6}}{(2 \times 81)^{-n/2}}$$

$$= \frac{3^n \times 2^{-n/2}}{2^{-n/2} \times (3^4)^{-n/2}} = \frac{3^n}{3^{-2n}} = 3^{n+2n} = 3^{3n}$$

Here we used law of indices,

$$(a^m)^n = a^{mn}; \frac{a^m}{a^n} = a^{m-n}; a^m \times a^n = a^{m+n}$$

251. If the average height of 10 also was 160 cm, 1600 cm would have been added without any change in the total average.

The fall was a total of

$$(40 + 10) \times (160 - 156) \text{ cm} = 200 \text{ cm}$$

So, the total height of 10 new students = 1600 - 200 = **1400 cm**

252. Formula : $\left[\frac{(x - y)}{100} \right] \%$;

$$(25 - 12) - 12\% \text{ of } 25 = 13 - 3 = \mathbf{10\% \text{ profit.}}$$

253. When Selling Price is the same and percentage of loss on one is equal to the percentage of gain on the other, then overall it is always, loss.

$$\% \text{ of Loss} = \frac{12^2}{10^2} = 1.2^2 = \mathbf{1.44\% \text{ Loss}}$$

254. $900 \times \frac{100 \times 15}{100 + 12 \frac{1}{2}} = \frac{900 \times 115 \times 2}{225} = \text{Rs. } 920$

New Selling Price;

He has to sell for **Rs. 20 more.**

255. We may take the speed of boat and speed of current as $(6 + 5) : (6 - 5) = 11 : 1$ which gives speed downstream as $11 + 1 = 12$ KMPH and in 5 Hrs. covers $5 \times 12 = 60$ KM. But the distance given is only 30 KM. So, the

speed of boat is $\frac{11}{2} = 5 \frac{1}{2}$ KMPH. Hence speed

of current is $\frac{1}{2}$ KMPH. Note the mental process of working.

256. From the problem,

$$\frac{L}{b} = \frac{5}{3} \text{ Also } Lb = 1500; 3L - 5b = 0;$$

$$b = \frac{1500}{L}; 3L - 5 \times \frac{1500}{L} = 0$$

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

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

fencing of field (Perimeter) = $2L + 2b = 2(50) + 2(30) = 100 + 60 = 160$ mts.

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

257. Difference between $6 \times 2\frac{1}{2}$ and $8 \times 1\frac{1}{2}$ is 3.

$$\text{So, the amount is } \frac{18}{3} \times 100 = \mathbf{Rs. 600}$$

258. $2 \times 12 + 12\% \text{ of } 12 = 24 + 1.44 = 25.44\%$

$$\text{Interest amount} = 25 \times 25.44 = \mathbf{Rs. 636}$$

259. $8\frac{1}{3}\%$ means $\frac{1}{12}$.

If Capital is Rs. 12, amount = Rs. 13

$$\text{Instalment amount} = \frac{11256 \times 13^3}{12(12^2 + 13^2 + 12 \times 13)}$$

$$= \frac{11256 \times 169 \times 13}{12(144 + 169 + 156)} = \frac{11256 \times 169 \times 13}{12 \times 469}$$

$$= 338 \times 13 = \mathbf{Rs. 4394}$$

260. Let the cost price be 100;

Marked Price = 10% higher than the cost price

$$\text{i.e. } 100 + \frac{10}{100} \times 100 = 110$$

$$\text{Marked price} = 110$$

$$\text{LESS : } 10\% \text{ discount} = 11$$

$$\text{Selling price} = \underline{\underline{99}}$$

Cost price - Selling price = Loss

$$100 - 99 = 1$$

261. In 3600 secs, the distance covered is 54000 mtrs.

$$\therefore \text{ in 15 secs, } \frac{15 \times 54000}{3600} = 225 \text{ mtrs.}$$

Length of the bridge is 150 mtrs.

\therefore Length of the train is $225 - 150 = 75$ mtrs.

262. Amount in 2 yrs. = Rs. 1000

Amount in 5 yrs. = Rs. 4000

\therefore Interest for 3 years = $4000 - 1000 = \text{Rs. } 3000$

$$R = \frac{100 \times SI}{PT} = \frac{100 \times 30}{1000 \times 3} = 33 \frac{1}{3}$$

$$P = \frac{100 \times SI}{RT} = \frac{100 \times 1000}{\frac{100}{3} \times 2}$$

$$= \frac{100 \times 1000 \times 3}{100 \times 2} = \mathbf{Rs. 1500}$$

263. Difference between the compound interest and simple interest for 2 years on a certain sum

$$\text{is} = \frac{Pr^2}{100^2}$$

$$\text{Hence } 90 = \frac{P \times 15 \times 15}{100 \times 100};$$

$$\therefore P = \frac{90 \times 100 \times 100}{15 \times 15} = \text{Rs. } 4000$$

$$264. \text{ Speed} = \frac{\text{distance}}{\text{time}} = \frac{100}{10} = 10 \text{ m/sec}$$

$$(\text{one km/hr} = \frac{5}{18} \text{ m/sec.})$$

$$\therefore \text{Speed of the train} = 10 \times \frac{18}{5} = 36 \text{ kmph}$$

265. First let us find the Cost Price of 15 pencils

Let the Cost Price of 15 pencils be Rs. x

By data $80 : 30 = 100 : x$

$$\therefore x = \frac{100 \times 30}{80} = \frac{75}{2};$$

$$\text{Selling Price of 15 pencils} = \frac{(100 + 30)}{100} \times \frac{75}{2}$$

$$\therefore \text{For Rs. } 52, \text{ the no. of pencils sold} \\ = 52 \times \frac{200 \times 15}{130 \times 75} = 16$$

$$266. 0.05 = \frac{5}{100} = \left(\frac{5}{100} \times 100 \right) \% = 5\%$$

$$267. x \% \text{ of } \frac{5}{8} = \frac{8}{5} \Rightarrow x = \frac{8}{5} \times \frac{100}{1} \times \frac{8}{5} = 256$$

$$268. \frac{x}{3} = (x-20) \Rightarrow x = 3(x-20) \\ \Rightarrow 2x = 60 \Rightarrow x = 30$$

$$269. \frac{3}{4}x = 60 \Rightarrow 60 \times \frac{4}{3} = 80$$

$$\text{Half of the number} = \left(\frac{1}{2} \times 80 \right) = 40$$

270. Let the numbers be x and y. Then $x - y = 11$

$$\text{and } \frac{1}{3}(x + y) = 7 \text{ (or) } x^2 + y = 21$$

Solving $x - y = 11$ and $x + y = 21$,
we get $x = 16, y = 5$

271. Let the numbers be 3x, 4x and 5x

$$\text{Total of these numbers} = 24 \times 3 = 72$$

$$\therefore 3x + 4x + 5x = 72 \Rightarrow x = 6$$

$$\text{The largest number} = 5x = 30$$

272. $a : b = 2 : 3; b : c = 3 : 4; a : b : c = 2 : 3 : 4$

$$\text{Also } \frac{a}{c} = \frac{a}{b} \times \frac{b}{c} = \frac{2}{3} \times \frac{3}{4} = \frac{1}{2}; a : c = 1 : 2$$

273. $A : B = 3 : 4; B : C = 4 : 5; C : D = 6 : 7$

$$\therefore \frac{A}{D} = \frac{3}{4} \times \frac{4}{5} \times \frac{6}{7} = \frac{18}{35} \Rightarrow A : D = 18 : 35$$

274. Let $a = 15, b = 16, c = 17$

$$\text{Then } s = \frac{1}{2}(a + b + c) = 24$$

$$\therefore s - a = 9, s - b = 8, s - c = 7$$

$$\therefore \text{Area} = \sqrt{s(s-a)(s-b)(s-c)} \\ = \sqrt{24 \times 9 \times 8 \times 7} = 109.98 \text{ cm}^2$$

275. The given fractions are equivalent to

$$\frac{12}{16}, \frac{40}{16}, \frac{15}{16} \therefore \text{H.C.F.} = \frac{1}{16}$$

279. Average \times Number = Total

$$\therefore 21 \text{ years} \times 22 \text{ nos} = 462 \text{ years ... (1)}$$

$$22 \text{ years} \times 23 \text{ nos} = 506 \text{ years ... (2)}$$

$$\therefore \text{Teacher's age} = (2) - (1)$$

$$= 506 - 462 = 44 \text{ years.}$$

280. $A : B = 2 : 3; B : C = 4 : 3$

$$A : B : C = 8 : 12 : 9 \therefore A : C = 8 : 9$$

$$281. A + B \text{'s one day's work} = \frac{1}{45} + \frac{1}{40} = \frac{17}{360};$$

Let A leave after x days

$$\therefore \text{The work done by both in x days} =$$

$$\frac{17x}{360} = \frac{360 - 17x}{360} = \frac{23}{40}$$

$$\therefore x = 9 \quad \text{Q B has worked for 23 days.}$$

$$282. \sqrt{.09} = 0.3$$

$$283. ? = 250 \times 350 - 170 = 87500 - 170 = 87330$$

$$284. ? = 7\frac{1}{2} + 6\frac{2}{5} - 3\frac{1}{4} = \frac{15}{2} + \frac{32}{5} - \frac{13}{4}$$

$$= \frac{75 + 64}{10} - \frac{13}{4} = \frac{139}{10} - \frac{13}{4}$$

$$= \frac{278 - 65}{20} = \frac{213}{20} = 10\frac{13}{20}$$

$$285. ? = 5.6 \times 4.5 + 3.4 = 25.2 + 3.4 = 28.6$$

$$286. ? = 40.84 \times 5.5 + 4.5 \times 6.40$$

$$= 224.62 + 28.8 = 253.42$$

$$287. 3\frac{1}{4} + 48\% \text{ of } 70 + 2.4 = ?$$

$$= 3.25 + 33.6 + 2.4 = 39.25$$

$$288. 61348 + 12109 - 19967 - ? = 34008$$

$$\Rightarrow ? = 19482$$

$$289. \sqrt{1089} + 5\frac{3}{4} \text{ of } 32 = ?$$

$$= 33 + 184 = 217$$

$$290. 3 + 5 \div 10 \times [2 + 6 - (12 \div 4 + 6 \div 3) \div 5 - 5] \div 4 = ?$$

$$\therefore ? = 3 + 5 \div 10 \times [2 + 6 - 5 \div 5 - 5] \div 4$$

$$\therefore ? = 3 + 5 \div 10 \times 2 \div 4 = 3 + \frac{1}{4} = 3\frac{1}{4}$$

$$291. \frac{65 \times 14 \div 25 + 19}{14 \times 25 \div 28 - ?} = 27.7$$

$$\therefore 14 \times 25 \div 28 - ? = \frac{54.4}{27.7} = 2 = 12.5 - ?$$

$$\therefore ? = 12.5 - 2 = 10.5$$

$$292. 78\% \text{ of } (2 \div 5) = 26\% \text{ of } ?$$

$$\Rightarrow ? = \frac{78\% \times 0.4}{26\%} = 1.2 = 1\frac{1}{5}$$

$$293. 1.6 : 0.0021 :: 140 : ?$$

$$\Rightarrow ? = \frac{140 \times 0.021}{1.6} = 1.8375$$

$$294. 28\% \text{ of } 0.4 + 48\% \text{ of } 0.20 = ?$$

$$= 0.112 + 0.096 = 0.208$$

$$295. 2194 + 6873 - 1951 - ? = 3587$$

$$= 7116 - ? \Rightarrow ? = 3529$$

296. The smallest number which is exactly divisible by 7, 9 and 15 is the L.C.M. of 7, 9 and 15, viz.

315. Now, any multiple of 315 would be exactly divisible by 7, 9 and 15. The largest such four digit number is 9765. ($315 \times 31 = 9765$, $315 \times 32 = 10080 \Rightarrow$ five digit number.)

297. The sum of remaining two numbers is equal to 5 times; $6 - 3 \text{ times } 4 = 30 - 12 = 18$

$$\therefore \text{Average} = 18 \div 2 = 9$$

298. An amount of Rs. P becomes 2P in 20 years.

$$\therefore \text{Rate of interest} = \frac{P \times 100}{P \times 20} = 5\%$$

$$299. \text{Compound interest} = P \left[\left(1 + \frac{r}{100} \right)^n - 1 \right]$$

$$\text{C.I.} = 3000 \times \left[\left(1 + \frac{10}{100} \right)^3 - 1 \right] =$$

$$3000 \times \left[\left(\frac{11}{10} \right)^3 - 1 \right] = 3000 \times \left[\frac{1331}{1000} - 1 \right]$$

$$= 3000 \times \frac{331}{1000} = \text{Rs. } 993$$

300. If A, B and C work together, the job will be finished in

$$\frac{1}{7} + \frac{1}{14} + \frac{1}{28} \text{ days} = \frac{4+2+1}{28} = \frac{7}{28} = \frac{1}{4} = 4 \text{ days}$$

301. Curved surface area = πrh square units.

$$r = \frac{1.4}{2} = 0.7; l = 4.2 \text{ cm}$$

$$\therefore \text{Curved surface area} = \frac{22}{7} \times 0.7 \times 4.2 = 2.2 \times 4.2 = 9.24 \text{ cm}^2$$

303. As per the formula $(a + b)^2 = a^2 + 2ab + b^2$

$$12 \times 12 + 2 \times 12 \times 15 + 15 \times 15$$

$$= (12 + 15)^2 = (27)^2 = 729$$

304. 1m 50 cm = 150 cm 1m 80 cm = 180 cm

$$\therefore \frac{150}{180} = \frac{5}{6} \text{ which is } 5 : 6.$$

305. $50 = 5^2 \times 2$; $40 = 5 \times 2^3$

$$\therefore \text{L.C.M} = 5^2 \times 2^3 = 200$$

306. In trigonometry, $\tan X = \frac{\text{opposite side}}{\text{adjacent side}}$

$$\tan X = \frac{YZ}{XY}; \text{ Here, } \tan X = \frac{6}{5}$$

307. 1 kg = 1000 gms; $\frac{510}{1000} = 0.51 \text{ gms.}$

308. $\frac{7}{8} = 0.875$; $\frac{6}{7} = 0.857$; $\frac{8}{10} = 0.800$

only $\frac{8}{9} = 0.889$ is the greatest fraction.

309. $150 + 175 = 325$; 325 m in 13 sec.

$$\text{In one second } \frac{325}{13} = 25 \text{ metres.}$$

To convert into km/hr, multiply by (60×60) and divide by 1000

$$\therefore \frac{25}{1000} \times 60 \times 60 = 90 \text{ km per hour.}$$

310. A : B = 2 : 3; B : C = 4 : 5

∴ A : B : C = 8 : 12 : 15 {∴ 2×4; 3×4; 3×5}

Now A : C = 8 : 15; C : D = 6 : 7

∴ A : C : D = 48 : 90 : 105

∴ A : D = 48 : 105 = 16 : 35

311. 10 m = 1 deca. m ∴ 56 m = 5.6 deca m.

312. (1) 2 : 5 (2) 3 : 13 (3) 4 : 9 (4) 100 : 1

313. $\left(\frac{5}{6} + \frac{11}{16}\right) \div \frac{73}{24} = \left(\frac{40+33}{48}\right) \div \frac{73}{24}$
 $= \frac{73}{48} \times \frac{24}{73} = \frac{1}{2}$

314. $1 + \frac{1}{1 + \frac{1}{1 - \frac{1}{6}}} = 1 + \frac{1}{1 + \frac{1}{\frac{5}{6}}} = 1 + \frac{1}{1 + \frac{6}{5}}$
 $= 1 + \frac{1}{\frac{11}{5}} = 1 + \frac{5}{11} = \frac{11+5}{11} = \frac{16}{11}$

315. $? = 4\frac{2}{3} + 3\frac{1}{5} + 1\frac{1}{2}$
 $= (4 + 3 + 1) + \left(\frac{2}{3} + \frac{1}{5} + \frac{1}{2}\right)$
 $= 8 + \left(\frac{20+6+15}{30}\right) = 8 + \frac{41}{30}$

316. The number series is based on the following pattern.

14.5 + 1 = 15.5; 15.5 + 2 = 17.5;

17.5 + 3 = 20.5; 20.5 + 4 = 24.5; 24.5 + 5 = 29.5

Therefore, the number 20 is wrong and it should be replaced by 20.5

317. 30% of 1860 + 40% of 820 = ?% of 3544

or $\frac{30 \times 1860}{100} + \frac{40 \times 820}{100} = \frac{? \times 3544}{100}$

or $30 \times 1860 + 40 \times 820 = ? \times 3544$

$? = \frac{55800 + 32800}{3544} = \frac{88600}{3544} = 25$

318. We know that

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

According to the question

Distance = 140 metres

Time = 7 seconds

∴ Speed = $\frac{140}{7} = 20$ m/sec.

∴ Speed in km per hour = $\frac{20 \times 18}{5} = 72$ kmph

319. Required price = $\frac{748.80}{4 \times 12} \times 29 = \text{Rs. } 452.40$
 = Rs. 450.00

320. $? = \frac{19}{7} \times \frac{64}{18} \times \frac{21}{38} \times \frac{54}{16} = 18$

321. $? = 999 + 99 + 9999 = 11097$

323. Let the two numbers be x and y.

∴ According to the question, $x + y = 37$ and

$x \times y = 330$

We know that $(x - y)^2 = (x + y)^2 - 4xy$.

or, $(x - y)^2 = (37)^2 - 330 \times 4$

or, $(x - y)^2 = 1369 - 1320$

or $(x - y)^2 = 49$

∴ $x - y = 7$

326. $\frac{4}{3} \times \frac{31}{8} \times \frac{5}{8} = \frac{155}{48}$

327. $847 - 770 = 77; \frac{77}{770} \times 100 = 10\%$

329. A - 10% more than B or 15% less than C;
 B - Rs. 85; A's earning = 85 + 10% of 85 = 93.5

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

330. A : B : C : $1\frac{1}{2} : 3\frac{1}{3} : 2\frac{3}{4}$ or

$\frac{3}{2} : \frac{10}{3} : \frac{11}{4} = \frac{18 : 40 : 33}{12}$

A : B : C = 18 : 40 : 33 (sum of the ratio 18 + 40 + 33 = 91); B's share = $91 \times \frac{40}{91} = \text{Rs. } 40$

331. With profit $12\frac{1}{2}\%$ $\left(\frac{1}{8}\right)$, Cost Price is

$144 \times \frac{8}{9} = \text{Rs. } 128$. Difference of Rs. 16 on each article. Loss on 3 articles broken at Selling Price rate = $3 \times 144 = \text{Rs. } 432$. Actual loss = Rs. 96. Apparent loss = $432 - 96 = \text{Rs. } 336$.

No. of transistors = $\frac{336}{16} = 21$

333. The ratio of value = $10 \times 7 : 20 \times 4 : 25 \times 3$
 = 70 : 80 : 75 = 14 : 16 : 15

Now the value of 25P = $90 \times \frac{15}{45} = 2 \times 15$.
 = 30 rupees; ∴ No. of 25 P. coins = $30 \times 4 = 120$.

334. $A : B = \frac{1}{5} : \frac{1}{4}$; $B : C = \frac{1}{2} : \frac{1}{3}$
 $A : B = 4 : 5$; $B : C = 3 : 2$
 $A : B : C = 12 : 15 : 10$; Divide in this ratio.
335. Savings should be 20% : 30% or 2 : 3 or 6 : 9
 But they are 3 : 4 or 6 : 8 leftside common
 So, the salaries are in ratio 9 : 8
 That is Rs. $\frac{510 \times 9}{17} = \text{Rs. } 270 = \frac{510 \times 8}{17}$
 = **Rs. 240**
336. $4 \times 10 - 4 \times 8 = 8$. The aggregate of last four is more and the last number is $8 + 4 = 12$.
337. The value $\sqrt{65^2 - 16^2} = 63$
 $\therefore \sqrt{65^2 - 16^2} = \sqrt{(65+16)(65-16)}$
 $= \sqrt{(81)(49)} = \sqrt{81} \sqrt{49} = 9 \times 7 = 63$
338. From the problem; $l = 2b$ (l = length ; b = breadth)
 (Perimeter = $2l + 2b$, if l & b are length & breadth respectively)
 \therefore Perimeter = $2(2b) + 2b = 6b$
339. $\frac{5(x+7)}{9} - 3 = 12$; $\frac{5x+35-27}{9} = 12$;
 $5x + 8 = 108$; $5x = 100$; $x = 20$
340. From the problem,
 $\frac{l}{b} = \frac{5}{3}$ Also $lb = 1500$; $3l - 5b = 0$;
 $b = \frac{1500}{l}$; $3l - \frac{5 \times 1500}{l} = 0$; $3l^2 = 7500$
 $l^2 = \frac{7500}{3} = 2500 = (50)^2$
 $\therefore l = 50$ $\therefore b = \frac{1500}{50} = 30$
 Fencing of field (Perimeter) = $2l + 2b = 2(50) + 2(30) = 100 + 60 = 160$ mts
 \therefore Cost of fencing = **Rs. 160** (\therefore 1m fencing costs Re.1)
341. Difference of interest in one year
 $= (9 \times 8) - (12 \times 3 \frac{1}{2}) = 72 - 42 = \text{Rs. } 30$
 To cover a difference of $(1200 - 900) = \text{Rs. } 300$
 Time of investment = $\frac{300}{30} = 10$ years

342. Distance covered by train to pass the railway signal
 $D = 180$ m.; Speed $V = 90$ km/hr
 $= \frac{90 \times 1000}{3600}$ m/sec = 25 m/sec
 Required time = $\frac{\text{Distance}}{\text{Speed}} = \frac{180}{25} = 7.2$ sec.
343. $\frac{a}{b} = \frac{1}{3}$; $3a = b$
 then $\frac{5a+b}{5a-b} = x$ (let)
 $x = \frac{5a+3b}{5a-3b} = \frac{8a}{2a} = 4$
344. $0.5 \times A = 0.0003$; $A = \frac{0.0003}{0.5} = 0.0006$
345. Purchasing price of one lemon = $\frac{100}{6}$ paise
 $= 16.66$ paise
 Profit = 20%
 Selling Price = Purchasing price + profit of one lemon
 $= 16.66 + \frac{16.66 \times 20}{100} = 16.66 + 3.33 = 20$ paise
 Therefore, No. of lemons per Rupee = $\frac{100}{20} = 5$
346. $\sqrt{0.0081} = \sqrt{0.09 \times 0.09} = 0.09$
347. $\sqrt{16 + \sqrt{80 + \sqrt{5000 - 4999}}}$
 $= \sqrt{16 + \sqrt{80 + \sqrt{1}}} = \sqrt{16 + \sqrt{81}}$
 $= \sqrt{16 + 9} = \sqrt{25} = 5$
348. Age of Z = $(46 \times 3) - (44.5 \times 2) = 49$ years. This answer is not given in any of the options. Hence, the correct choice is "None of these"
349. S.I. $\frac{P \times R \times T}{100} \Rightarrow 1080$
 $= \frac{P \times 8 \times 3}{100} \Rightarrow P = \text{Rs. } 4500$
350. Let the sides of two squares be $(3X)$ and $(5X)$ centimeters respectively. Thus, $(3X)^2 + (5X)^2 = 306 \Rightarrow X = 3$. Thus, the required side of smaller square would be 9 cms.