

Avg of squares of first n natural nos. = $((n+1)(2n+1))/6$

Avg of cubess of first n natural nos. = $((n)(n+1)^2)/4$

Avg of nos. in A.P. = $(\text{first no.} + \text{last no.})/2$

Avg of first n multiples of any number = $(\text{Number} * (n+1))/2$

Shortcut Tricks

- (i) Sum of n natural number = $\frac{(n)(n+1)}{2}$
- (ii) Sum of n even number = $(n)(n+1)$
- (iii) Sum of n odd number = n^2

Q: Find the greatest number that will divide 544, 474 and 369 leaving remainders 4, 6 and 9 respectively ?

- a) 36 ✓✓
- b) 24
- c) 42
- d) 30

Handwritten solution on a chalkboard:

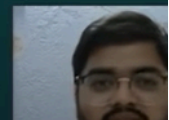
Step 1: $\text{HCF} \left(\frac{544-4}{9}, \frac{474-6}{9}, \frac{369-9}{9} \right)$

Step 2: $\text{HCF} \left(\frac{60}{4}, \frac{52}{4}, \frac{40}{4} \right)$

Step 3: $\text{HCF} (15, 13, 10) = 1$

Final Answer: $1 \times 4 \times 9 = 36$

Additional notes: $\star \div (9)$, $\div (4)$, $1, 5, 13, 15$, $1, 13$, $1, 2, 5, 10$



Next Q"

Q: A school has 120, 192 and 144 students enrolled for its science, arts and commerce courses. All students have to be seated in rooms for an exam such that each room has students of only the same course and also all rooms have equal number of students. What is the least number of rooms needed?

- a) 18
- b) 21
- c) 19
- d) 20

Handwritten solution for the first question:

$$\text{HCF} \left(\frac{120}{12}, \frac{144}{12}, \frac{192}{12} \right) = \frac{10}{1}, \frac{12}{1}, \frac{16}{1}$$

$$\text{LCM} (10, 12, 16) = 240$$

$$\frac{240}{12} = 20$$

120 ÷ 20 = 6
192 ÷ 20 = 9.6
144 ÷ 20 = 7.2

LCM of 6, 9.6, 7.2 = 24

120 ÷ 24 = 5
192 ÷ 24 = 8
144 ÷ 24 = 6

5 + 8 + 6 = 19

Q: A school has 120, 192 and 144 students enrolled for its science, arts and commerce courses. All students have to be seated in rooms for an exam such that each room has students of only the same course and also all rooms have equal number of students. What is the least number of rooms needed?

- a) 18
- b) 21
- c) 19 ✓✓
- d) 20

Handwritten solution for the second question:

$$\frac{120}{24} = 5, \frac{192}{24} = 8, \frac{144}{24} = 6$$

$$5 + 8 + 6 = 19$$

q:

Q1: In this question x^y stands for x raised to the power y . For example, $2^3=8$ and $4^{1.5}=8$.

If a, b are real numbers such that $a+b=3$, $a^2+b^2=7$, the value of a^4+b^4 is?

- a) 49
- (b) 45
- (c) 51
- (d) 47

TCS 2016

Ans: 47

1. $71 \cdot 72 \cdot 73 \cdot 74 \cdot 75 \cdot 76 \cdot 77 \cdot 78 \cdot 79$

2. $111!$

3. $(((((1232)^{92463})^{43261})^{9264321})^{1900})$ (Advance)

ans: 0 1 6

4. A batsman makes a score of 87 runs in 17th innings and thus increases his avg by 3. Find his average after 17th inning. (PYQ)

5. The avg. age of teacher and three students is 20yrs. If all the three students are of same age and the diff between the age of the teacher and each student is 20yrs, find age of the teacher.

4. $17\text{inn} \times \text{inc avg } 3 = 51 \text{ runs}$

Now, asked for only 18th inn so

Prev runs $87 - 51 \text{ runs} = 36 \text{ runs alone in 18th inn}$

Asked avg after 17th inn = $36 \text{ runs} + \text{increased } 3 \text{ avg per inn} = 39 \text{ ans}$

5. 35 ans

6.

6. The avg. marks obtained by 40 students of a class is 85. The diff between the marks obtained by the students who got the highest mark and the lowest mark is 108. If both the students are removed the avg. falls by 1 mark. Find the highest mark. (Advance)

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7. P is 30% more efficient than Q, P can complete a work in 23days. If P and Q work together how much time will it take to complete same work?

8. 3 men and 4 boys can complete a piece of work in 12days. 4 men and 3 boys can do the same work in 10days. Then 2 men and 3 boys can finish the work in? (Advance)

7. 13

8. 17.5

9. Efficiency of A, B and C is in the ratio 4:5:6. What is the ratio of the time in which they complete the work?

$\frac{1}{4} : \frac{1}{5} : \frac{1}{6}$
 $\xrightarrow{\text{Eq } \frac{1}{T}}$
 $\frac{24}{4} : \frac{24}{5} : \frac{24}{6} \rightarrow 6 : 4.8 : 4$
 $\rightarrow 15 : 12 : 10$

10. A contractor took a job with 51 men and estimated to complete in certain no. of days. After $\frac{1}{4}$ th of the estimated time, only $\frac{1}{5}$ th of the work was completed. If the client extends the deadline by 10% of the original estimated time, how many more men will the contractor need to finish the job? (Advance)

10 ans 9 men

11. A person travelled a distance of 50km in 8hrs, he covered a part of distance on foot at 4km/hr and part of bicycle at 10km/hr, how much distance travelled on foot?

$$= \frac{155}{35} - \frac{1}{5} \Rightarrow 4.5 = 2.5 \text{ km/hr}$$

12. A train after travelling 70km encounters a trouble in the engine due to which its speed becomes $\frac{3}{4}$ th of the original and it reaches the destination 50 mins late. It was calculated that had the trouble would have been developed after travelling 85km the train would have been late by only 38 mins. Find the original speed of the train. (Advance)

11. 20km

12. 25km/hr

13. A train X starts from Meerut at 4pm and reached Ghaziabad at 5pm. While another train Y starts from Ghaziabad at 4pm and reaches Meerut at 5:30pm. The two trains will cross each other at? (Advance)

$$t_3 + \frac{(t_3 - t_2)(t_3 - t_4)}{(t_1 - t_2) + (t_3 - t_4)}$$

14. A train of speed 45m/s crosses a man running in opp. direction with a speed of 5m/s in 6s and crosses a platform in 20s, then find the length of the platform.

13. 4:36PM

14. 600m

-----> travelled in opp direction add down the speeds , --> same dir subtract

←

→

15. Kamal can row a certain distance downstream in 12h and come back to the same point in 18h. If the stream flows at the rate of 6km/h, then find the speed of Kamal in still water?

$$\begin{aligned}
 & \text{Let } x = \text{speed of Kamal in still water} \\
 & \text{Downstream speed} = x + 6 \\
 & \text{Upstream speed} = x - 6 \\
 & 12(x + 6) = 18(x - 6) \\
 \Rightarrow & 12x + 72 = 18x - 108 \\
 \Rightarrow & 6x = 180 \Rightarrow x = \frac{180}{6} = 30 \text{ km/h}
 \end{aligned}$$

15. down stream $s(\text{man}) + s(\text{river})$
 Up stream $s(\text{man}) - s(\text{river})$