

**x divides  $((49)^{15} - 1)$  completely. What is x?**

- A) 8      B) 14      C) 50      D) 51**

**An amount of Rs.340 is to be divided among 200 boys and girls, so that each boy gets Rs.2.00ps. and each girl Rs.1.50 what is the ratio of the number of boys and girls?**

**A) An amount of Rs.8400 is distributed among A, B and C in the ratio of 1:2:4. Find the difference between the shares of A & C is?**

**B) An amount is distributed among P, Q & R in the ratio of 2:3:8. The difference between the shares of P & R is Rs.2,400 what is the share of Q ?**

$$\begin{array}{l} P:Q:R \\ (2):3:(8) \end{array}$$
  
$$\begin{array}{l} 6P \quad \quad 2400 \\ 3P \quad \quad 2 \\ \hline \quad \quad \quad 1200 \end{array}$$
  
$$\begin{array}{r} 3 \times 400 \\ \underline{3 \times 2400} \\ 6 \end{array} = 1200$$

A) An amount of Rs.8400 is distributed among A, B and C in the ratio of 1:2:4. Find the difference between the shares of A & C is?

B) An amount is distributed among P,Q & R in the ratio of 2:3:8. The difference between the shares of P & R is Rs.2,400 what is the share of Q ?

The number to be added to each of the numbers 8, 11, 12 and 16 to form the terms of a proportion is

- A) 2                      B) 3                      C) 4                      D) 5

Handwritten calculations in red ink:

- $8 : 11 :: 12 : 16$
- ~~$10 : 13 :: 14 : 18$~~
- $11 : 14 :: 15 : 19$
- $12 : 15 :: 16 : 20$

Arrows and circles indicate the process of testing different values (2, 3, 4, 5) by adding them to each number and checking if the resulting four numbers form a proportion. The value 4 is circled as the correct answer.

The number to be added to each of the numbers 8, 11, 12 and 16 to form the terms of a proportion is

- A) 2                      B) 3                      C) 4                      D) 5

**A) Find the mean proportion of 25 & 100.**

**B) Find the mean proportion of 20 & 320.**

$$\begin{aligned}\text{Mean pro} &= \sqrt{a \times b} \\ \sqrt{25 \times 100} &= 5 \times 10 = 50 \\ \sqrt{2500} &= 50 \\ \cancel{\sqrt{20 \times 320}} &= \cancel{80}\end{aligned}$$

**A) Find the mean proportion of 25 & 100.**

**B) Find the mean proportion of 20 & 320.**

**A) Find the third proportion of 81 & 72.**

**B) Find the third proportion of 36 & 72.**

$$\begin{aligned}\text{3rd pro} &= \frac{B \times B}{A} = \frac{8 \times 8}{72 \times 72} = 64 \text{ Ans} \\ &\quad \frac{81}{9}\end{aligned}$$

**A) Find the forth proportion of 12, 42 & 60.**

**B) Find the forth proportion of 45, 185 & 180.**

If a carton containing a dozen mirrors is dropped, which of the following can be the ratio of the broken mirrors to unbroken mirrors?

- A) 2 : 5      B) 1 : 4      C) 3 : 2      D) 5 : 1

If a carton containing a dozen mirrors is dropped, which of the following cannot be the ratio of the broken mirrors to unbroken mirrors?

- A) 2 : 1      B) 1 : 1      C) 3 : 2      D) 5 : 7

A)  $A : B = 2 : 3$ ,  $B : C = 6 : 7$  and  $C : D = 35 : 24$ .

Find the  $A : D$  ?

B)  $P : Q = 2 : 5$ ,  $Q : R = 27 : 16$ ,  $R : S = 4 : 9$  and  $S : T = 15 : 8$ . Find the  $P : T$ ?

$$\cancel{A} : \cancel{B} = \frac{\cancel{A}}{\cancel{B}}$$

$$\frac{\cancel{A}}{\cancel{B}} \times \frac{\cancel{B}}{\cancel{C}} \times \frac{\cancel{C}}{\cancel{D}} = \frac{A}{D} = \underline{A : D}$$

$$\frac{2}{3} \times \frac{16}{27} \times \frac{35}{4 \times 9} = \frac{5}{6} = \underline{5 : 6}$$



A)  $A : B = 2 : 3$ ,  $B : C = 6 : 7$  and  $C : D = 35 : 24$ .

Find the  $A : D$  ?

B)  $P : Q = 2 : 5$ ,  $Q : R = 27 : 16$ ,  $R : S = 4 : 9$  and  $S : T = 15 : 8$ . Find the  $P : T$ ?

$A : B = 1 : 2$ ,  $B : C = 3 : 4$  and  $C : D = 5 : 6$   
then find the  $A : B : C : D$  ?

A)  $15 : 30 : 40 : 48$

B)  $48 : 30 : 15 : 40$

C)  $30 : 40 : 48 : 15$

D)  $15 : 48 : 40 : 30$

A student was asked to find  $7/8^{\text{th}}$  of a number. But by mistake he find  $8/7^{\text{th}}$  of the number and got 450 more then original answer. What is the number?

A) 1680

B) 1740

C) 1860

D) 1920

$$x \times \frac{8}{7} - x \times \frac{7}{8} = 450$$

$$\frac{8x}{7} - \frac{7x}{8} = 450$$

$$\frac{64x - 49x}{56} = 450$$

$$\frac{15x}{56} = 450$$

$$x = \underline{1680}$$

A student was asked to find  $\frac{7}{8}^{\text{th}}$  of a number. But by mistake he find  $\frac{8}{7}^{\text{th}}$  of the number and got 450 more then original answer. What is the number?

- A) 1680      B) 1740      C) 1860      D)1920

If 1 is added to the denominator of a fraction becomes  $(\frac{1}{2})$ . If 1 is added to the numerator, the fraction becomes 1. The fraction is?

- A)  ~~$\frac{4}{7}$~~       B)  $\frac{5}{9}$       C)  $\frac{2}{3}$       D)  $\frac{10}{11}$

Handwritten work for the second question:

$$\frac{4}{7+1} = \frac{4}{8} \quad \frac{5}{9} \quad \frac{2}{3} \quad \frac{10}{11}$$

$$\frac{4}{8} = \frac{1}{2} \quad \frac{5}{9} \quad \frac{2}{3} \quad \frac{10}{11}$$

$$\frac{5}{9} \quad \frac{2}{3} \quad \frac{10}{11}$$

$$\frac{2}{3} = 1 \quad \frac{10}{11}$$

If 1 is added to the denominator of a fraction becomes  $(\frac{1}{2})$ . If 1 is added to the numerator, the fraction becomes 1. The fraction is?

- A)  $\frac{4}{7}$       B)  $\frac{5}{9}$       C)  $\frac{2}{3}$       D)  $\frac{10}{11}$

In a class of each student contributed as many rupees as the number of students and the teacher contributed Rs.155 and the total collection was Rs.1116. How many students are there in the class?

- A)21                      B) 29                      C) 31                      D)39

$$\begin{aligned}
 1116 - 155 &= 961 & x^2 &= 961 \\
 31 \times 31 &= 961 & x \times x &= 961 & x &= (31) \\
 \begin{array}{r}
 31 \times 31 = 961 \\
 \underline{155} \\
 1116
 \end{array}
 \end{aligned}$$

In a class of each student contributed as many rupees as the number of students and the teacher contributed Rs.155 and the total collection was Rs.1116. How many students are there in the class?

- A)21                      B) 29                      C) 31                      D)39

What is the smallest number with which 9450 should be multiplied to make it a perfect square? Also with what least number should 9450 be multiplied to make it a perfect cube ?

$$\begin{array}{l}
 9450 = 945 \times 10 \\
 2 \times 5 \times 5 \times 189 \\
 2 \times 5 \times 5 \times 3 \times 63 \\
 (21) \quad 2 \times 2 \times 5 \times 7 \times 7 = \\
 20 \times 49 = 980 \\
 \boxed{2 \times 3 \times 7} = 42 \\
 2 \times 2 \times 5 \times 7 \times 7 = 980
 \end{array}$$

What is the smallest number with which 9450 should be multiplied to make it a perfect square? Also with what least number should 9450 be multiplied to make it a perfect cube ?

A boy wanted to write from the smallest number to the greatest number of three digits. How many times he needs to press the keys of the computer to do this job ?

- A) 2708      B) 2889      C) 2644      D) 2978



If X and Y are two digits of the number 347XY such that the number is completely divisible by 80, then what is the value of X and Y?

A) 2

B) 4

C) 6

D) 8

$$\begin{array}{r} \boxed{347XY} \\ \hline \text{Divisible by } 80 \\ 8 \times 10 \end{array}$$

$$\begin{aligned} X &= \\ Y &= 0 \end{aligned}$$

380 mangoes are distributed among some boys and girls who are 85 in number. Each boy gets four mangoes and each girl gets six mangoes give. The number of boys are ? 3

$$G = 20 \quad 65(B)$$

$$85 \times 4 = \frac{380}{40}$$

$$G \text{ and } B = \frac{40}{2} = 20$$

$$65(B) \checkmark$$

$$\begin{array}{r} 85M = 510 \\ 380 \\ \hline 130 \end{array}$$

$$B = \frac{130}{2} = 65 \quad G = 20$$

380 mangoes are distributed among some boys and girls who are 85 in number. Each boy gets four mangoes and each girl gets six mangoes give. The number of boys are ?

In an examination, a student is awarded 4 marks for every correct answer and loses 2 marks for every wrong answer. If a student attempted all 75 questions and secured 150 marks, the number of questions he attempted correct is ?

Which of the following numbers is exactly divisible by 99 ?

- A) 114543      B) 1592307  
C) 111437      D) 931741

Handwritten calculations:

$1+7=8$

Sum of the total only 9

$99 = 9 \times 11$

$114543 \xrightarrow{9} 9=0$

$0000 = 0-0=0$

11  
22  
33

Which of the following numbers is exactly divisible by 99 ?

A) 114543

B) 1592307

C) 111437

D) 931741

( 51+52+53+54+55+ .....98+99+100 ) =?

$$\begin{aligned}
 &1+2+3+\dots+100 = \frac{n(n+1)}{2} \\
 &\frac{100 \times 101}{2} = 5050 \\
 &1+2+3+\dots+50 = \frac{50 \times 51}{2} = 1275 \\
 &\underline{5050} \\
 &\quad \underline{1275} \\
 &\quad \quad 3775
 \end{aligned}$$
  

$$\begin{aligned}
 &50+50+\dots+50 \\
 &51+52+\dots+100 \\
 &\boxed{1+2+3+\dots+50}
 \end{aligned}$$
  

$$\begin{aligned}
 &\frac{n(n+1)}{2} = \frac{50 \times 51}{2} \\
 &\quad = 1275 \\
 &50 \times 50 = 2500 \\
 &\quad \underline{1275} \\
 &\quad \quad 3775
 \end{aligned}$$
  

$$\begin{aligned}
 &151 \\
 &51+52+53+\dots+98+99+100 \\
 &\quad \quad \quad 151
 \end{aligned}$$
  

$$\begin{aligned}
 &151 \times 25 = 3775
 \end{aligned}$$

A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is:

- A) ~~18~~      B) ~~24~~      C) 42      D) 81
- Handwritten calculations for option A:  $\begin{array}{r} 18 \\ +18 \\ \hline 36 \end{array}$
- Handwritten calculations for option B:  $\begin{array}{r} 24 \\ +18 \\ \hline 42 \end{array}$
- Handwritten calculations for option C:  $\begin{array}{r} 42 \\ +18 \\ \hline 60 \end{array}$
- Handwritten calculations for option D:  $\begin{array}{r} 81 \\ +18 \\ \hline 99 \end{array}$

A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is:

- A) 18      B) 24      C) 42      D) 81

If one-third of one-fourth of a number is 15, then three-tenth of that number is:

- A) 35      B) 36      C) 45      D) 54

Handwritten calculations for the second problem:

Left side:  $\frac{1}{3} \text{ of } \frac{1}{4} \text{ of } N = 15$   
 $N = 15 \times 12$   
 $N = 180$   
 $N \times \frac{3}{10} = 54$

Right side:  $\frac{1}{3} \text{ of } \frac{1}{4} \text{ of } N = 15$   
 $N = 15 \times 12$   
 $N = 180$   
 $N \times \frac{3}{10} = 54$



If one-third of one-fourth of a number is 15, then three-tenth of that number is:

- A) 35      B) 36      C) 45      D) 54

x divides  $((49)^{15} - 1)$  completely. What is x?

- A) 8      B) 14      C) 50      D) 51

Handwritten calculations for the second question:

$$\begin{aligned} & \frac{((49)^{15} - 1)}{8} = \frac{((7^2)^{15} - 1)}{8} = \frac{7^{30} - 1}{8} \\ & \frac{7^{30} - 1}{8} = \frac{(7^2)^{15} - 1}{8} = \frac{49^{15} - 1}{8} \end{aligned}$$

The calculations show that 8 divides  $((49)^{15} - 1)$  completely.

An amount of Rs.340 is to be divided among 200 boys and girls, so that each boy gets Rs.2.00ps. and each girl Rs.1.50 what is the ratio of the number of boys and girls?

Handwritten calculations for the third question:

$$\begin{aligned} & 200 \times 1.50 = 300 \\ & 340 - 300 = 40 \\ & \text{Boys: } \frac{40}{1} = 40 \times \frac{2}{1} = 80 \\ & \text{B:G} \\ & 80:120 \\ & 2:3 \end{aligned}$$