



RAILWAY



RATIO & PROPORTION



MARATHON

8/25



10.07.2026



2:00 PM



AADIL SIR

WELCOME TO



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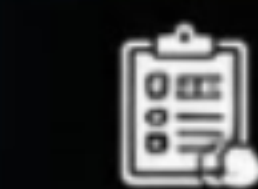
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$$\begin{array}{ccc} 3 & 2 & 5 \\ 60 & 70 & ?x \end{array}$$

68

$$180 + 140 + 5x = 680$$

$$320 + 5x = 680$$

$$5x = 360$$

$$x = 72$$

1. भौतिकी, रसायन विज्ञान और गणित में एक छात्र के भारित औसत अंक 68 हैं। भौतिकी, रसायन विज्ञान और गणित विषयों के भारांक 3 : 2 : 5 के अनुपात में हैं। यदि छात्र ने भौतिकी में 60 और रसायन विज्ञान में 70 अंक प्राप्त किए हैं, तो गणित में अंक ज्ञात कीजिए।

The weighted average marks of a student in Physics, Chemistry and Mathematics are 68. The weights of the subjects Physics, Chemistry and Mathematics are in the ratio 3 : 2 : 5. If the student has scored 60 in Physics and 70 in Chemistry, find the marks in Mathematics.

A) 68

B) 66

C) 72

D) 74

$a, b, 20$

$$\frac{b \times 20}{a} = \frac{9}{36}$$

$$\frac{b}{a} = \frac{9}{5}$$

$$\sqrt{45} = 3\sqrt{5}$$

2. पहली संख्या, दूसरी संख्या और 20 का चतुर्थानुपाती 36 है। यदि पहली दो संख्याओं का योगफल 14 है, तो पहली दो संख्याओं का गुणोत्तर माध्य ज्ञात कीजिए।

The fourth proportional of the first number, second number and 20 is 36. If the sum of the first two numbers is 14, find the geometric mean of the first two numbers.

A) $5\sqrt{3}$

B) $3\sqrt{5}$

C) $5\sqrt{2}$

D) $2\sqrt{5}$

$$\sqrt{ab}$$

A. B. B. ?

9, 21

$$\begin{array}{r} 21 \times 21 \\ \hline 9 \end{array}$$

49

3. वह सबसे छोटी प्राकृतिक संख्या 'x' क्या है, जिसे 13 और 25 में से घटाने पर प्राप्त संख्याओं का चतुर्थानुपाती 49 हो जाए?

What is the smallest natural number 'x' which when subtracted from 13 and 25 makes the fourth proportional of the resulting numbers 49?

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

$$\begin{array}{c} 4 \quad 6, x \\ \hline 2 : 3 \end{array}$$

$$\frac{4}{6} \times \frac{6}{x}$$

$$x = \frac{24}{4} \quad \textcircled{9}$$

4. दो छड़ों की लंबाई 4 cm और 6 cm है। एक तीसरी छड़ इस प्रकार बनाई जाती है कि तीनों छड़ें वितत समानुपात में हों। तीसरी छड़ की लंबाई कितनी होगी?

The lengths of two rods are 4 cm and 6 cm. A third rod is made such that the three rods are in continued proportion. What will be the length of the third rod?

- A) 12 cm
- B) 10 cm
- C) 8 cm
- ~~D) 9 cm~~

$$\begin{array}{r}
 3 : 2 = 5 \\
 \downarrow \times 14.8 \\
 99.6 \\
 + 6 \\
 \hline
 35.6
 \end{array}$$

$\times 14.8$
 $\downarrow$
 74

5. दो संख्याओं का योग 72 है। यदि बड़ी संख्या में 8 की वृद्धि की जाए और छोटी संख्या में 6 की कमी की जाए, तो परिणामी संख्याएँ क्रमशः 3 : 2 के अनुपात में होती हैं। मूल दो संख्याओं में से छोटी संख्या ज्ञात कीजिए।

The sum of two numbers is 72. If the larger number is increased by 8 and the smaller number is decreased by 6, the resulting numbers are in the ratio 3 : 2 respectively. Find the smaller of the two original numbers.

A) 32.5

☒ B) 35.6

C) 35

D) 34.2

$$\begin{array}{r}
 72 + 8 - 6 \\
 \hline
 74
 \end{array}$$

6. $(2 + \sqrt{3})$ और $(10 - \sqrt{75})$ का मध्यानुपाती ज्ञात कीजिए।

Find the mean proportional of $(2 + \sqrt{3})$ and $(10 - \sqrt{75})$.

A) $\sqrt{3}$

B) $2\sqrt{3}$

C) $\sqrt{3}$

D) $\sqrt{5}$

$2\sqrt{3} + 3$
 $5\sqrt{3}$

$\sqrt{AB}$

$$\sqrt{20 - 10\sqrt{3} + 10\sqrt{3} - 15}$$

$$\sqrt{5}$$

$$a - b = 20 \quad \sqrt{AB} = 24$$

$$a + b = 52 \quad AB = \underline{\underline{576}}$$

$$a = 36$$

$$b = 16$$

$$\frac{72}{2} = 36$$

7. दो धनात्मक संख्याओं का अंतर 20 है। इन दोनों संख्याओं के बीच का मध्यानुपाती 24 है। इन दोनों संख्याओं का योगफल ज्ञात कीजिए।

The difference between two positive numbers is 20. The mean proportional between these two numbers is 24. Find the sum of these two numbers.

~~A) 53~~

~~B) 51~~

~~C) 52~~

~~D) 50~~

$$\begin{array}{ccc}
 \text{I} & \text{II} & \text{III} \\
 2x & : & 1x & : & 10x = 13 \times 24 \\
 & & & & \text{312} \\
 \frac{10x \times x}{2x} & = & 120 \\
 & \nearrow & \\
 x & = & 24
 \end{array}$$

8. तीन धनात्मक संख्याओं का चतुर्थानुपाती 120 है। यदि पहली संख्या दूसरी संख्या की दोगुनी है और तीसरी संख्या पहली संख्या की पाँच गुनी है, तो तीनों संख्याओं का योग ज्ञात कीजिए।

The fourth proportional of three positive numbers is 120. If the first number is twice the second number and the third number is five times the first number, find the sum of the three numbers.

- A) 288
- B) 336
- C) 300
- D) 312

चतुर्थानुपाती A, B, C

$$\boxed{\frac{B \times C}{A}}$$

$$l = \frac{81 \times 81}{27} \quad \boxed{243}$$

$$b = 4$$

$$A = l \times b$$

$$243 \times 4$$

$$\boxed{972}$$

9. यदि 27 और 81 एक समानुपात के पहले दो पद हैं और इन संख्याओं के तृतीयानुपाती का उपयोग 4 इकाई चौड़ाई वाले आयत की लंबाई के रूप में किया जाता है, तो आयत के क्षेत्रफल का संख्यात्मक मान क्या होगा?

If 27 and 81 are the first two terms of a proportion and the third proportional of these numbers is used as the length of a rectangle having a width of 4 units, what will be the numerical value of the area of the rectangle?

☒ A) 972

B) 6561

C) 729

D) 486

$$2288 - (39 + 47 + 40) = 2162$$

$$17:15:14 = 46 \times 47$$

$17 \times 46 = 782$
 $15 \times 46 = 690$
 $14 \times 46 = 644$

$782 - 47 = 735$
 $690 - 47 = 643$
 $644 - 47 = 597$

$735 - 47 = 688$
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 $597 - 47 = 550$

$688 - 47 = 641$
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 $456 - 47 = 409$

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 $-5704 - 47 = -5751$
 $-5841 - 47 = -5888$

$-5751 - 47 = -5798$
 $-5751 - 47 = -5798$
 $-5888 - 47 = -5935$

$-5798 - 47 = -5845$
 $-5798 - 47 = -5845$
 $-5935 - 47 = -5982$

$-5845 - 47 = -5892$
 $-5845 - 47 = -5892$
 $-5982 - 47 = -6029$

$-5892 - 47 = -5939$
 $-5892 - 47 = -5939$
 $-6029 - 47 = -6076$

$-5939 - 47 = -5986$
 $-5939 - 47 = -5986$
 $-6076 - 47 = -6123$

$-5986 - 47 = -6033$
 $-5986 - 47 = -6033$
 $-6123 - 47 = -6170$

$-6033 - 47 = -6080$
 $-6033 - 47 = -6080$
 $-6170 - 47 = -6217$

$-6080 - 47 = -6127$
 $-6080 - 47 = -6127$
 $-6217 - 47 = -6264$

$-6127 - 47 = -6174$
 $-6127 - 47 = -6174$
 $-6264 - 47 = -6311$

$-6174 - 47 = -6221$
 $-6174 - 47 = -6221$
 $-6311 - 47 = -6358$

$-6221 - 47 = -6268$
 $-6221 - 47 = -6268$
 $-6358 - 47 = -6405$

$-6268 - 47 = -6315$
 $-6268 - 47 = -6315$
 $-6405 - 47 = -6452$

$-6315 - 47 = -6362$
 $-6315 - 47 = -6362$
 $-6452 - 47 = -6499$

$-6362 - 47 = -6409$
 $-6362 - 47 = -6409$
 $-6499 - 47 = -6546$

$-6409 - 47 = -6456$
 $-6409 - 47 = -6456$
 $-6546 - 47 = -6593$

$-6456 - 47 = -6503$
 $-6456 - 47 = -6503$
 $-6593 - 47 = -6640$

$-6503 - 47 = -6550$
 $-6503 - 47 = -6550$
 $-6640 - 47 = -6687$

$-6550 - 47 = -6597$
 $-6550 - 47 = -6597$
 $-6687 - 47 = -6734$

$-6597 - 47 = -6644$
 $-6597 - 47 = -6644$
 $-6734 - 47 = -6781$

$-6644 - 47 = -6691$
 $-6644 - 47 = -6691$
 $-6781 - 47 = -6828$

$-6691 - 47 = -6738$
 $-6691 - 47 = -6738$
 $-6828 - 47 = -6875$

$-6738 - 47 = -6785$
 $-6738 - 47 = -6785$
 $-6875 - 47 = -6922$

$-6785 - 47 = -6832$
 $-6785 - 47 = -6832$
 $-6922 - 47 = -6969$

$-6832 - 47 = -6879$
 $-6832 - 47 = -6879$
 $-6969 - 47 = -7016$

$-6879 - 47 = -6926$
 $-6879 - 47 = -6926$
 $-7016 - 47 = -7063$

$-6926 - 47 = -6973$
 $-6926 - 47 = -6973$
 $-7063 - 47 = -7110$

$-6973 - 47 = -7020$
 $-6973 - 47 = -7020$
 $-7110 - 47 = -7157$

$-7020 - 47 = -7067$
 $-7020 - 47 = -7067$ <

$$\frac{5x \times 7x}{2x} = \frac{20}{140}$$

$$x = 8$$

$$5x = 5 \times 8 = 40$$

11. तीन संख्याएँ 2 : 5 : 7 के अनुपात में हैं और इन्हें क्रमशः प्रथम, द्वितीय और तृतीय पद के रूप में लिया जाता है। यदि इनका चतुर्थानुपाती 140 है, तो मध्य संख्या (middle number) ज्ञात कीजिए।

Three numbers are in the ratio 2 : 5 : 7 and they are taken as the first, second and third terms respectively. If their fourth proportional is 140, find the middle number.

- A) 50
- B) 35
- C) 30
- D) 40

$$\frac{1}{8} : \frac{1}{20} : \frac{2}{5} = 33$$

$$\begin{array}{r} 5278 \\ 196 \\ \hline 5082 \end{array}$$

12. ₹5,278 को X, Y और Z में इस प्रकार विभाजित किया जाता है कि यदि उनके संबंधित हिस्सों में से क्रमशः ₹67, ₹61 और ₹68 घटा दिए जाएं, तो उनके पास शेष राशि का अनुपात 8 : 20 : 5 होता है। कटौती के बाद X का हिस्सा ज्ञात कीजिए।

₹5,278 is divided among X, Y and Z in such a way that if ₹67, ₹61 and ₹68 are subtracted from their respective shares, the ratio of their remaining amounts becomes 8 : 20 : 5. Find X's share after deduction.

A) ₹1,132 ✗

B) ₹1,082 ✗

C) ₹1,232 ✓

D) ₹1,332 ✗

$$\begin{array}{r} 241 \quad 241 \\ \hline 482 \times 482 \end{array}$$

$$\frac{8}{100} \times 100$$

$$\begin{array}{r} 57840 \\ 241 \\ \hline 29081 \\ \hline \end{array}$$

13. 8 और 48.2 का तृतीयानुपाती ज्ञात कीजिए।
Find the third proportional of 8 and 48.2.

A) 290.405

B) 292.805

C) 296.605

D) 294.205

A, B

$$\frac{B^2}{A}$$

$$\begin{array}{r} 240 \\ 241 \\ \hline \end{array}$$

14. यदि 2, x और 18 वितत समानुपात में हैं, तो x का धनात्मक मान ज्ञात कीजिए।

If 2, x and 18 are in continued proportion, then find the positive value of x.

A) 12

B) 4

C) 6

D) 9

$$\frac{2}{x} = \frac{x}{18}$$

$$\underline{x = 6}$$

$$x = \sqrt{2 \times 18}$$

$$x = 6$$

$$\frac{3}{45} \times \frac{3}{45} = \frac{3}{5x \times 6x}$$

$$x^2 = 3^2$$

$$x = 3$$

15. ^A75 और ^B45 का तृतीयानुपाती, 10, 5x और 6x के चतुर्थानुपाती के समान है। x का मान ज्ञात कीजिए।

The third proportional of 75 and 45 is equal to the fourth proportional of 10, 5x and 6x. Find the value of x.

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



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16. दो थैलों में 5 : 7 के अनुपात में कंचे हैं। यदि दूसरे थैले से 12 कंचे को पहले थैले में स्थानांतरित किया जाए, तो दोनों थैलों में कंचों का अनुपात 7 : 5 हो जाता है। दूसरे थैले में कंचों की मूल संख्या ज्ञात कीजिए।

Two bags contain marbles in the ratio 5 : 7. If 12 marbles are transferred from the second bag to the first bag, the ratio of marbles in the two bags becomes 7 : 5. Find the original number of marbles in the second bag.

~~A) 68~~

~~B) 42~~

C) 63

~~D) 72~~

$$\begin{array}{lcl}
 \text{I} & & \text{II} \\
 \hline
 5 & : & 7 \\
 \downarrow & & \uparrow \\
 2 & & 12 \\
 \times 6 & & \times 6 \\
 \hline
 12 & & 42
 \end{array}$$

Handwritten solution showing the process of finding the original number of marbles in the second bag. It starts with the ratio 5 : 7. To find the original number of marbles, it multiplies both terms by 6, resulting in 30 : 42. Then, it subtracts 12 from the second term (42 - 12 = 30) to get the new ratio 30 : 30, which simplifies to 1 : 1. This indicates that the original number of marbles in the second bag was 42.

$$\frac{50}{8} = 6.25$$

$$\checkmark \frac{70}{11} = 6.36$$

$$\frac{30}{5} = 6$$

17. एक कॉलेज में, विज्ञान और कला के विद्यार्थियों का अनुपात उसके तीन बैचों में से प्रत्येक के लिए अलग-अलग है। बैच A में यह अनुपात 5 : 8 है, बैच B में यह अनुपात 7 : 11 है और बैच C में यह अनुपात 3 : 5 है। किस बैच में विज्ञान के विद्यार्थियों का सर्वाधिक अनुपात (proportion) है?

In a college, the ratio of students of Science and Arts is different for each of its three batches. In batch A this ratio is 5 : 8, in batch B this ratio is 7 : 11 and in batch C this ratio is 3 : 5. Which batch has the highest proportion of Science students?

- ~~A) बैच B~~
 B) बैच C
 C) सभी का अनुपात समान है
 D) बैच A

18. 12 और किसी संख्या के बीच का मध्यानुपाती, 9 और 16 के बीच के मध्यानुपाती का दोगुना है। वह संख्या ज्ञात कीजिए।

The mean proportional between 12 and a number is twice the mean proportional between 9 and 16. Find that number.

A) 56

B) 72

C) 60

D) 48

$$\sqrt{12 \times x} = 2 \sqrt{9 \times 16}$$

$$\cancel{3} \cancel{12} \times x = 4 \times \cancel{9} \times 16$$

$$x = 48$$

Handwritten solution for the problem:

$$\begin{array}{l} \text{A} \\ 5 \end{array} : \begin{array}{l} \text{B} \\ 7 \end{array} \xrightarrow{\times 28} \begin{array}{l} 140 \\ 196 \end{array}$$

$$\text{① } 1 \times 6 : 1 \times 6 = 2 \times 6$$

28

19. किसी कंपनी में दो विभाग 'A' और 'B' हैं, जिनमें कर्मचारियों का अनुपात क्रमशः 5 : 7 है। यदि 28 कर्मचारियों को विभाग 'B' से 'A' में स्थानांतरित किया जाता है, तो अनुपात 1 : 1 हो जाता है। मूल रूप से प्रत्येक विभाग में कितने कर्मचारी थे?

There are two departments 'A' and 'B' in a company, in which the ratio of employees is 5 : 7 respectively. If 28 employees are transferred from department 'B' to 'A', the ratio becomes 1 : 1. How many employees were there originally in each department?

- A) A में 140, B में 84
 B) A में 150, B में 84
 C) A में 140, B में 196
 D) A में 140 और B में 96

$$\begin{array}{r}
 \underline{A} \quad \quad \underline{B} \quad \quad \underline{C} \\
 15 : 17 \quad \quad 17 \\
 14 \quad \quad 14 : 19 \\
 \hline
 210 : 238 : 323 = 1
 \end{array}$$

20. A, B और C तीन बल्लेबाज हैं। एक मैच में उनके द्वारा बनाए गए रनों का अनुपात $A : B = 15 : 17$ और $B : C = 14 : 19$ था। मैच के अंत में, उन्होंने 1542 रन बनाए। A द्वारा बनाए गए रनों की संख्या ज्ञात कीजिए।

A, B and C are three batsmen. In a match, the ratio of runs scored by them was $A : B = 15 : 17$ and $B : C = 14 : 19$. At the end of the match, they scored 1542 runs. Find the number of runs scored by A.

~~A) 520~~

~~B) 420~~

C) 540

D) 480

5

$$\sqrt{18 \times 50}$$

$$\sqrt{900}$$

$$(30)$$

21. एक फिटनेस पार्क में, एक सीधी पैदल पथ को तीन लगातार खंडों में विभाजित किया गया है। पहले और तीसरे खंड की लंबाई क्रमशः 18 m और 50 m है। यदि मध्य खंड की लंबाई, अन्य दो खंडों की लंबाई के बीच मध्यानुपाती है, तो उसकी लंबाई कितनी होगी?

In a fitness park, a straight walking path is divided into three consecutive segments. The lengths of the first and third segments are 18 m and 50 m respectively. If the length of the middle segment is the mean proportional between the lengths of the other two segments, then what will be its length?

- ☒ A) 30 m B) 27 m
 C) 25 m D) 36 m

22. यदि 37, 25 और 888 का चतुर्थानुपाती x है, तो x का मान कितना होगा?

If the fourth proportional of 37, 25 and 888 is x , then what will be the value of x ?

A) 400

B) 800

C) 500

~~D) 600~~

$$x = \frac{25 \times 888}{37}$$

$$\begin{array}{r} 24 \\ 3 \overline{) 888} \\ \underline{84} \\ 48 \\ \underline{48} \\ 0 \end{array}$$

23. नीचे दिए गए अनुपातों में से सबसे बड़ा अनुपात कौन-सा है?

Which of the following ratios is the largest?

A) 5 : 8

B) 3 : 5

☒ C) 7 : 11

D) 4 : 7

$$\frac{5}{8} = 6.25$$

$$\frac{3}{5} = 6$$

$$\frac{7}{11} = 6.36$$

$$\frac{4}{7} = 5.$$

$$\begin{array}{ccc} \underline{X} & \underline{Y} & \underline{Z} \\ 8 & 4 & 5 \end{array} \quad \begin{array}{l} \times 560 \\ \times 560 \end{array}$$

$8 : 4 : 5 = 17$

2240

24. ₹9,520 को X, Y और Z के बीच $\frac{1}{2} : \frac{1}{4} : \frac{5}{16}$ के अनुपात में विभाजित किया जाता है। Y का हिस्सा कितना है?

₹9,520 is divided among X, Y and Z in the ratio $\frac{1}{2} : \frac{1}{4} : \frac{5}{16}$. What is the share of Y?

A) ₹3,200

B) ₹2,240

C) ₹2,600

D) ₹4,000

16

25. कुल धनराशि को E, F, G और H के बीच 9:7:5:3 के अनुपात में विभाजित किया जाता है। यदि G को F से ₹4000 कम मिलते हैं, तो E को कितनी धनराशि प्राप्त होगी?

A total sum of money is divided among E, F, G and H in the ratio 9:7:5:3. If G gets ₹4000 less than F, then how much money will E receive?

A) ₹16000

B) ₹20000

C) ₹18000

D) ₹17000

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$$\begin{array}{cccc}
 E & F & G & H \\
 9 & 7 & 5 & 3
 \end{array}$$

Handwritten notes:

- A bracket under 9 and 7 with an 'x' indicates a common factor.
- An arrow from 7 to 5 is labeled '2'.
- An arrow from 5 to 3 is labeled '2'.
- An arrow from the '2' between 5 and 3 points to '4000'.
- An arrow from the '2' between 7 and 5 points to '2000'.

26. यदि दो संख्याओं का तृतीयानुपाती 32 है और दूसरी संख्या 16 है, तो पहली संख्या ज्ञात कीजिए।

If the third proportional of two numbers is 32 and the second number is 16, find the first number.

- A) 7
- B) 5
- C) 8
- D) 6

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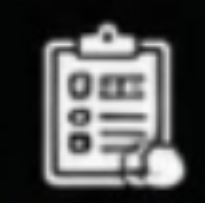
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