
FACE
Prep

Ratio & Proportion, Variation, Simple Equations and Problems on Ages

FACE Prep

Ratio
Drill 1

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Question

The ratio of the number of 50 paise coins and one rupee coins with Ramya is 7 : 10. If the value of the 50 paise coins with her is Rs. 280, then what is the number of one rupee coins with her?

A) Let the number of 1 rupee coins with her be _____

B) The number of 50 paise coins that will sum up to Rs. 280 is

C) Ratio of 50 paise coins and 1 rupee coins = _____ : _____

D) Number of 50 paise coins and 1 rupee coins = _____ & _____

Question

If a : b = 3 : 5, b : c = 5 : 4, c : d = 2 : 3, find the ratio between a and d.

A) Relate ‘a’ to ‘c’ through ‘b’a : b : c = _____ : _____ : _____

B) Now relate ‘a’ to ‘d’ through ‘b’ &‘c’. a : b : c : d = _____ : _____ : _____ : _____

Question

The ratio of the ages of Abishek, Bala, Chitra and Deepak is 8:10:7:9 respectively. The oldest person is 9 years older than the youngest person. Find the age of Abishek.

A) Let the ages of Abishek, Bala, Chitra and Deepak be _____, _____, _____ & _____ respectively.

B) The difference in age between the oldest and the youngest as per assumption = _____

C) The difference in age between the oldest and the youngest as given in the question = _____

D) Equating the above two, the value of the constant = _____
Abishek's age = _____

Proportion
Drill 2

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Question

The ratio of ages of Bhavana and Gowtham is 2 : 3. Bhavana's present age is 24. If the ages of Bhavana, Gowtham and Chirag are in continued proportion, find Chirag's age?

A) Ratio of ages of Bhavana and Gowtham = _____ : _____

B) Ratio of ages of Gowtham and Chirag = _____ : _____

C) Ratio of ages of Bhavana, Gowtham and Chirag = _____ : _____ : _____

D) Chirag's age = _____

Question

What is the least number that must be subtracted from 18, 30 & 54 such that the resultant numbers are in continued proportion?

A) Assumed value that must be subtracted from 18, 30 & 54, so that they will be in continued proportion = _____

B) Frame the equation for continued proportion: _____ = _____

C) Solve the equation and find the value of the assumed variable.

Question

A Policeman takes 7 steps for every 5 steps of the thief, but the distance covered by 5 steps of the thief is equal to 6 steps of the Policeman. What is the ratio of speed of the Policeman to that of the thief?

A) Ratio of number of steps covered by the policeman and the thief in unit time = _____ : _____

B) 5 steps of a thief is equal to 6 steps of the Policeman, therefore Ratio of distance covered by the policeman and the thief per step = _____ : _____

C) Ratio of distance covered by the policeman and the thief in unit time =

D) Hence, ratio of speeds = _____ : _____

Variation Drill 3

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Question

The amount of water evaporating from a pond in a day is proportional to the surface area of the pond. 70 litres of water evaporates in a day from a pond of area 1250 m^2. If 42 litres of water evaporates in a day from a pond, what will be the area of that pond?

A) Assumed variables for water evaporating and area of pond are ____& ____

B) Relation between water evaporating and area of pond is _____ μ _____

C) Modified equation with proportionality constant, _____= _____

Question

The amount of water evaporating from a pond in a day is proportional to the surface area of the pond. 70 litres of water evaporates in a day from a pond of area 1250 m^2. If 42 litres of water evaporates in a day from a pond, what will be the area of that pond?

D) Solving, value of proportionality constant = _____

E) Equation with value proportionality constant, _____ = _____

F) Substitute the value of water evaporating in a day as 42 and find the size of the pond.

Question

The mileage obtained by a car is directly proportional to the average speed at which it is travelling and is inversely proportional to the passenger load. The car gets a mileage of 20 kmph when it is travelling at a speed of 60 kmph and the passenger load is 150 kg. What will be the mileage when the car is travelling at a speed of 70 kmph with a passenger load of 140 kg?

A) Assumed variables for mileage, speed and passenger load are _____ & _____

B) Relation between mileage, speed and passenger load is = _____

C) Modified equation with proportionality constant, _____ = _____

D) Solving, value of proportionality constant = _____

E) Equation with value proportionality constant, _____ = _____

Question

The mileage obtained by a car is directly proportional to the average speed at which it is travelling and is inversely proportional to the passenger load. The car gets a mileage of 20 kmph when it is travelling at a speed of 60 kmph and the passenger load is 150 kg. What will be the mileage when the car is travelling at a speed of 70 kmph with a passenger load of 140 kg?

A) Assumed variables for mileage, speed and passenger load are _____, _____ & _____

B) Relation between mileage, speed and passenger load is = _____

C) Modified equation with proportionality constant, _____ = _____

Question

The mileage obtained by a car is directly proportional to the average speed at which it is travelling and is inversely proportional to the passenger load. The car gets a mileage of 20 kmph when it is travelling at a speed of 60 kmph and the passenger load is 150 kg. What will be the mileage when the car is travelling at a speed of 70 kmph with a passenger load of 140 kg?

D) Solving, value of proportionality constant = _____

E) Equation with value proportionality constant, _____ = _____

F) Substitute the value of speed as 70 kmph and passenger load as 140 kg and find the mileage _____

Question

A diamond falls down and breaks into 3 pieces whose weights are in the ratio 1 : 3 : 6. The value of a diamond is proportional to square of its weight. If the original value was Rs. 30,000, then what is the loss in value due to breakage?

A) Assume the weights of the 3 broken pieces to be _____, _____ and _____

B) Weight of the unbroken diamond (sum of the weights of the three broken pieces) = _____

C) Assume proportionality constant for the value of diamonds _____

Question

A diamond falls down and breaks into 3 pieces whose weights are in the ratio 1 : 3 : 6. The value of a diamond is proportional to square of its weight. If the original value was Rs. 30,000, then what is the loss in value due to breakage?

D) Value of the unbroken piece of diamond as per assumption = _____

E) Value of the unbroken piece of diamond as given in question = _____

F) Equating, value of the constant is _____ = _____

G) Loss in value = _____

Linear Equations
Drill 4

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Question

In a group of goats and ducks, the total number of legs is 10 more than thrice the number of heads. If the number of goats and ducks put together is 30, find the number of goats.

Let the number of goats and ducks be _____ & _____

Frame equation for the statement: “Number of legs is 10 more than thrice the number of heads”.

Equation (1)
Frame equation for the statement: “Number of goats and ducks put together is 30”.

Question

Equation (2)
Multiply the equations with suitable values, such that one of the variables can be eliminated

(1) X _____ --> _____
(2) X _____ --> _____

Solve the equations and find the number of goats.

Question

A railway half ticket costs half the full fare and the reservation charge is the same on half ticket as on full ticket. One reserved first class ticket from Chennai to Trivandrum costs Rs. 216 and one full and one half reserved first class ticket cost Rs. 327. What is the reservation charge?

Let the full fare and reservation charges be _____ & _____

Frame equation for the statement: “One reserved first class ticket from Chennai to Trivandrum costs Rs. 216”.

Equation (1)
Frame equation for the statement: “One full and one half reserved first class tickets cost Rs. 327”.

Question

Equation (2)
Multiply the equations with suitable values, such that one of the variables can be eliminated.

Solve the equations and find the reservation charge _____

Problems on Ages
Drill 5

FACE Prep

Question

The ages of Arun and Bala are in the ratio 3 : 1. Fifteen years hence, the ratio of their ages will be in the ratio 2 : 1. Find the present age of Arun.

Let the ages of Arun and Bala be _____ and _____

Frame equation for the statement: “The ages of Arun and Bala are in the ratio 3 : 1”.

Equation (1)
Frame equation for the statement: “Fifteen years hence, the ratio of their ages will be in 2 : 1”.

Question

Equation (2)
Multiply the equations with suitable values, such that one of the variables can be eliminated

Solve the equations and find Arun’s age _____

Question

The sum of the present ages of a father and his son is 60 years. Six years ago, the father's age was five times the age of the son. After 6 years, what will be the son's age?

Let the ages of the Father and the Son be _____ and _____

Frame equation for the statement: "The sum of the present ages of a father and his son is 60 years".

Equation (1)
Frame equation for the statement: "Six years ago, father's age was five times the age of the son".

Question

Equation (2)
Multiply the equations with suitable values, such that one of the variables can be eliminated

Solve the equations and find the son’s age after 6 years _____

Concept Review Questions

Question

21 pencils and 29 pens cost Rs. 79. But, if the number of pencils and pens were interchanged, the cost would have reduced by Rs. 8. Find the cost of each pen.

A) 1

B) 2

C) 3

D) 4

Question

If 1½ years is added to 3/7th of the age of Ravi, it will be half of his present age. What is his present age?

A) 14 years

B) 21 years

C) 28 years

D) None of these

Question

One year ago, a father was 8 times as old as his son. Now, his age is the square of his son's age. Find the age of the father

A) 24

B) 49

C) 48

D) 25

Question

The cost of registration at a professional association meeting was Rs. 50 per person. Lunch was provided to the participants at an additional cost of Rs. 24. If the number of participants who paid for lunch was 100 more than
the number who did not, and if receipts for registration and lunch totalled Rs. 69400, how many people paid just for registration at the meeting?

A) 1100

B) 800

C) 500

D) 600

Question

There are two examination rooms, A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B. The number of students in room A is

A) 40

B) 80

C) 100

D) None of these

Question

The ratio of a father's age to his son's age is 4 : 1. The product of their ages is 196. What will be the ratio of their ages after 5 years?

A) 3 : 2

B) 4 : 11

C) 11 : 4

D) 4 : 1

Question

A bag contains Rs. 102 in the form of 1 rupee, 50 paise and 10 paise coins in the ratio 3 : 4 : 10. What is the number of 10 paise coins?

A) 170

B) 160

C) 68

D) None of these

Question

In a parking lot with only two and four wheelers, there are a certain number of four wheelers and 28 two wheelers. What can be the possible number of tyres in the parking lot?

A) 66

B) 62

C) 72

D) 82

Question

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

A) 4 : 2

B) 3 : 1

C) 3 : 2

D) 7 : 5

Question

A earns twice as much as B does but spends two and a half times of what B does. If both of them save Rs. 2000 each, find A's earning.

A) 12,000

B) 16,000

C) 8,000

D) None of these

Question

A zookeeper counted the heads of the animals in a zoo and found it to be 80. When he counted the legs of the animals he found it to be 260. If the zoo had only pigeons and horses, how many horses were there in the zoo?

A) 40

B) 30

C) 50

D) 60

Question

Free notebooks were distributed equally among the children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. How many notebooks were distributed totally?

A) 512

B) 64

C) 1024

D) 8

Question

Aldrin was to earn $ 300 and a free holiday for seven weeks' work. He worked for only 4 weeks and earned $ 30 and a free holiday. What was the value of the holiday?

A) $ 90

B) $ 330

C) $ 270

D) Data insufficient

Question

The force of attraction between 2 bodies varies inversely as the square of distance between them. When two bodies are 2 feet apart, force of attraction is 18 N. What is the force of attraction, when they are 3 feet apart?

A) 9 N

B) 8 N

C) 40.5 N

D) 12 N

Question

Jack bought 10 apples, 15 pears and Jill bought 20 apples and some pears.

Jack paid Rs. 20 for his purchase and Jill paid Rs. 40 for his purchase.
How many pears did Jill buy?

A) 45

B) 30

C) 15

D) Cannot be determined

Practice Exercise

Question

Some tickets of a show are sold at Rs. 10 per ticket and the other tickets at Rs. 8 per ticket. In all, 105 tickets were sold. If the amount collected on a day was Rs. 922, find the number of tickets sold at Rs. 10.

A) 43

B) 41

C) 42

D) 34

Question

In a CAT examination, a student scores 3 marks for every correct answer and loses 1 mark for every wrong answer. A student attempts all the 60 questions and scores 140 marks. What is the number of questions that he answered correctly?

A) 48

B) 46

C) 50

D) None of these

Question

The ratio of present ages of father and son is 4 : 1. The father was 36 years old when his daughter, who is 6 years younger to his son, was born. Find the present ages in years of the father and the son.

A) 8, 12

B) 32, 8

C) 40, 10

D) 60, 15

Question

The ratio of number of boys to that of girls in a college is 7 : 8. If the percentage increase in the number of boys and girls is 20% and 10% respectively, then what will be the new ratio?

A) 21 : 22

B) 22 : 21

C) 20 : 19

D) 19 : 20

Question

To fill a tank, 25 buckets of water are required. How many buckets of water will be required to fill the same tank if the capacity of the bucket is reduced to two-fifth of its present?

A) 10

B) 35

C) 125

D) 62.5

Question

The system of equations $3X + Y - 1 = 0$ and $6X + 2Y - 2 = 0$

A) has $X = 1$ and $Y = 2$ as solution

B) has $X = -1$ and $Y = -2$ as solution

C) does not have a solution

D) has infinitely many solutions

Question

At a dinner party every two guests used a bowl of rice between them, every three guests used a bowl of dal among them and every four used a bowl of meat between them. There were altogether 65 dishes. How many guests were present at the party?

A) 60

B) 65

C) 90

D) None of the above

Question

In a two-digit number, if it is known that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and the sum of its digits is equal to 144, then the number is:

A) 24

B) 26

C) 42

D) 46

Question

My father and mother have three children (two sons and a daughter). My brother is 3 years elder to me. My father was 28 years of age when my sister was born while my mother was 26 years of age when I was born. If my sister was 4 years of age when my brother was born, then what was the age my father and mother respectively when my brother was born.

A) 32 yrs, 23 yrs

B) 32 yrs, 29 yrs

C) 35 yrs, 29 yrs

D) 35 yrs, 33 yrs

Question

The present ages of Daniel and Rajiv are in the ratio of 2 : 3 respectively. Four years ago, the ratio of their ages was 1 : 2. Four years hence, the ratio of their ages will become?

A) 5 : 6

B) 1 : 3

C) 3 : 4

D) Cannot be determined

Question

A father said to his son, “I was as old as you are at present, at the time of your birth”. If the father’s age after 10 years will be 50 years then the son’s age is

A) 15 yrs

B) 18 yrs

C) 20 yrs

D) 21 yrs

Question

In the convocation program of a college, the students of a class arrange themselves for a Photograph in such a way that each row of students above the bottom row contains one student less than the row just below it. If there are 5 rows in all and a total of 75 students in the class, how many students does the bottom row contain?

A) 14

B) 15

C) 16

D) 17

Question

Dravid gets on the elevator at the 24th floor of a building and rides up at the rate of 40 floors per minute. At the same time, Rahul gets on an elevator at the 54th floor of the same building and rides down at the rate of 20 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross?

A) 34

B) 44

C) 54

D) 37

Question

Sabarmati is as much younger than Rani as Sabarmati is older than Sneha. If the sum of the ages of Rani and Sneha is 64 years, then what is Sabarmati's age?

A) 44 yrs

B) 32 yrs

C) 20 yrs

D) Data inadequate

Question

Sixteen candies are to be distributed among four boys Anish, Dinesh, Mohan and Poovaraghavan such that each boy receives at least one candy and no two boys receive the same number of candies. Poovaraghavan should receive 4 more candies than Dinesh. The number of candies received by Dinesh should be less than that received by Anish but more than that received by Mohan. If Anish receives the maximum number of candies, then what is the number of candies that Anish can receive?

A) 7

B) 5

C) 10

D) 4

Question

If 12 years is subtracted from the present age of a grandfather and the remainder is divided by 13, then the age of his grandson is obtained. If the grandson celebrated his first year birthday before 3 years, then find the present age of the grandfather (in years).

A) 59

B) 64

C) 50

D) 65

Question

If a : b = 2 : 5, then find (2a + b) : (a + 5b).

A) 9 : 25

B) 1 : 3

C) 2 : 5

D) 4: 25

Question

Divide 1458 into two parts such that the two parts are in the ratio 2 : 7.

A) 324, 1134

B) 1296, 162

C) 486, 972

D) 810, 648

Question

1040 litres of milk is divided in two parts in the ratio x : 21. If the first part is 200 litres, find x.

A) 5

B) 4

C) 10

D) 8

Question

Two numbers are in the ratio 7 : 9. If 12 is subtracted from each of them, the ratio becomes 3 : 5. What is the product of the numbers?

A) 567

B) 343

C) 657

D) 546

Question

What must be added to each term of the ratio 7 : 13 so that the ratio becomes 2 : 3?

A) 5

B) 6

C) 4

D) 7

Question

If W varies directly with F and when W = 24, F = 6. Find the value of W when F = 10?.

A) 26

B) 38

C) 40

D) 32

Question

On 1st January, 2008 the average age of a family of 5 people was ‘A’ years. After 3 years a child was born in the family and one year after that the average age was again found to be ‘A’ years. What is the value of ‘A’? (Assume that there are no other deaths and births.)

A) 20

B) 15

C) 21

D) 19

Question

Joseph’s father is 5 times older than Joseph and Joseph is twice as old as his sister Alice. In two years time, the sum of their ages will be 58. How old
is Joseph now?

A) 4

B) 9

C) 8

D) 12

Question

A shopkeeper likes to arrange and rearrange her collection of flowers. She arranges them sometimes in pairs, sometimes in bundles of three, sometimes in bundles of fours, occasionally in bundles of fives and sixes. Every time she‘s left with one flower in hand after arranging them in bundles. But if she arranges in the bundle of seven, she’s not left with any flower. What is the least number of flowers she must have for that to be possible?

A) 288

B) 298

C) 301

D) 303

Question

A man went to the market to buy fruits. He bought apples, mangoes and dates. The ratio of the weight of apples to that of mangoes bought is same as the ratio of the weight of mangoes to that of dates bought. If he bought 7.2 kg of apples and 5 kg of dates, find the weight of mangoes bought.

A) 6

B) 3

C) 5

D) 4

Question

A boy 1.4 m tall casts a shadow 1.2 m long at the time when a building casts a shadow 5.4 m long. What is the height of the building?

A) 6.3

B) 6.8

C) 6

D) 7

Question

Find the present age of a woman, whose age 15 years ago was equal to the sum of the ages that her two children will be 15 years from now. The younger child, 5 years from now, will be 17 and the elder 12 years ago was double the age of the younger 3 year ago.

A) 80 yrs

B) 87 yrs

C) 75 yrs

D) 70 yrs

Question

The owner of a local jewel store hired 3 watchmen to guard his diamonds but a thief still got in and stole some diamonds. On the way out, the thief met all the watchmen, one at a time. To each of then, he gave half of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

A) 40

B) 36

C) 32

D) 38

Question

Two balls have their radii in the ratio of 1 : 3. What is the ratio of their volumes?

A) 1 : 27

B) 1 : 18

C) 2 : 27

D) 1 : 24

Self Assessment and Test Analysis

FACE Prep

Question

There are a certain number of bees in a garden. One fifth of them were attracted to a particular flower. A third of them were attracted to another flower. Three times the difference between the number of bees that went to the first and the second flower went to a third flower. One lone bee was roaming around. How many bees were attracted to the flowers?

A) 17

B) 25

C) 14

D) 15

Question

If 0.75 : x : 5 : 8, then x is equal to:

A) 1.12

B) 1.2

C) 1.25

D) 1.15

Question

Two trains running in opposite directions cross a man standing on the platform in 25 seconds and 15 seconds respectively and they cross each other in 18 seconds. The ratio of their speeds is:

A) 1 : 3

B) 3 : 5

C) 3 : 7

D) 5 : 3

Question

If $x + y = 1$, then what is the value of $(x^3 + y^3 + 3xy)$?

A) 1

B) 3

C) 9

D) -1

Question

Ravi distributed the chocolates with him equally between Rajesh and Suresh. He was left with one chocolate. Rajesh distributed his share equally among three of his friends and was also left with a chocolate. One of the three distributed his share equally among four of his friends and was left with no chocolate. Which of the following could be the number of chocolates that Rajesh received?

A) 22

B) 34

C) 49

D) 53

Question

The cost of diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ratio 1:2:3:4. When the pieces were sold, the merchant got Rs. 70,000 less than what he would have got for the original diamond. Find the original price of the diamond?

A) Rs. 30,000

B) Rs. 1,00,000

C) Rs. 2,00,000

D) Rs. 1,30,000

Question

In covering a distance, the speeds of A & B are in the ratio of 5 : 4. A takes 30 minutes less than B to reach the destination. The time taken by A to reach the destination is

A) 0.5 hr

B) 2.5 hrs

C) 2 hrs

D) Data Inadequate

Question

A student gets an aggregate of 60% marks in five subjects, in the ratio 10 : 9 : 8 : 7 : 6. The pass marks is 50% of the maximum marks for all the subjects. If each subject has the same maximum marks, in how many subjects did he pass the examination?

A) 2

B) 3

C) 4

D) Cannot be determined

Question

A Milky bar chocolate costs Rs. 5, Diary milk costs Rs. 6 and a coffee bite costs Rs. 3. If Bharathi plans to buy atleast one chocolate of each type and a distinct number of chocolates in each category, then what can be the maximum number of chocolates she can buy for Rs. 82?

A) 22

B) 3

C) 25

D) 27

Question

Sanjeev has exactly eight sealed boxes containing 24, 34, 19, 36, 72 20, 16 and 18 coins. Out of the eight boxes with Sanjeev, there are exactly seven boxes that contained silver coins whereas one box contained gold coins. He distributed all the eight boxes among his three sons in such a manner that his eldest son got the only box with gold coins and the other boxes were distributed in such a manner so that the other two brothers received the silver coins in the ratio of 2 : 1 & also no coin has been taken out of the boxes. How many gold coins were there in one of the boxes with Sanjeev?

A) 20

B) 19

C) 16

D) Cannot be determined

THANK YOU

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