



# MATHS

## BOOKS - S CHAND IIT JEE FOUNDATION

### RATIO AND PROPORTION

#### Example

1.

If

$$a : b = \frac{2}{9} : \frac{1}{3}, b : c = \frac{2}{7} : \frac{5}{14} \text{ and } d : c = \frac{7}{10} : \frac{3}{5},$$

then find  $a : b : c : d$ .



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2. If  $A : B : C = 2 : 3 : 4$  , then what is  $\frac{A}{B} : \frac{B}{C} : \frac{C}{A}$  equal to?



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3. If

$$A : B = 1 : 2, B : C = 3 : 4 \text{ and } C : D = 5 : 6$$

find  $D : C : B : A$



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4. Devide 170 into three parts such that the first part is 10 more than the second and its ratio with the third part iis 2: 5



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



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6. If the ratio of boys to girls in a class is B and the ratio of girls to boys is G, then  $3(B+G)$  is equal to 3

(b) less than 3

(c) more than 3

(d) less than  $\frac{1}{3}$



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7. In a maximum of 45 litres, the ratio of milk and water is 4 : 1 How much water must be added to make the mixture ratio 3: 2?



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**8.** In a class , the number of girls is 20% more than that of boys. The strength of the class is 66. How many more girls must be admitted to the class, so that the ratio of the number of boys to that of the girls becomes 2 : 3



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**9.** When rupees 4572 is divided among A,B and C such that three times of A's share is equal to 4

times of B's share is equal 6 times C's share.

What is A's share ?



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**10.** A bag contains 50 paise , 1 rupee and 2 rupee coins in the ratio 2 : 3: 4 . If the total amount is rupees 240 what is the total number of coins?



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**Question Bank 15**

1. If  $A : B = 5 : 2$ ,  $B : C = 2 : 3$  and  $C : D = 5 : 3$ , then the ratio  $A : B : C : D$  is

A.  $25 : 10 : 15 : 9$

B.  $10 : 5 : 3 : 2$

C.  $15 : 5 : 3 : 2$

D.  $25 : 10 : 15 : 3$

**Answer: A**



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2.

if

$$P:Q = 2:3, Q:R = 5:7 \text{ and } R:S = 3:10$$

then  $P:S = ?$

A.  $1:5$

B.  $1:7$

C.  $3:2$

D.  $6:15$

**Answer: B**



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3. If  $\frac{3a + 5b}{3a - 5b} = 5$ , then a: b is equal to

A. 2: 1

B. 5: 3

C. 3: 2

D. 5: 2

**Answer: D**



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4.

If

$$A : B = \frac{1}{2} : \frac{3}{8}, B : C = \frac{1}{3} : \frac{5}{9} \text{ and } C : D = \frac{5}{6} : \frac{3}{4},$$

then the ratio  $A : B : C : D$  is 4:6:8:10 b.

6:8:9:10 c. 8:6:10:9 d. 6:4:8:10

A. 6:4:8:10

B. 6:8:9:10

C. 8:6:10:9

D. 4:6:8:10

**Answer: C**



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5. If  $a : b = 3 : 5$  and  $b : c = 6 : 2$ , find  $a : b : c$

A.  $4 : 9 : 45$

B.  $9 : 15 : 5$

C.  $16 : 36 : 20$

D.  $4 : 36 : 20$

**Answer: B**



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6. If  $a : b = 2 : 5$ , then  $(3a + 4b) : (5a + 6b)$  is equal to

A.  $13/20$

B.  $26/33$

C.  $16/27$

D.  $18/35$

**Answer: A**



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7. If  $\frac{2a + b}{a + 4b} = 3$ , the value of  $\frac{a + b}{a + 2b}$  is equal to

A.  $\frac{5}{9}$

B.  $\frac{2}{7}$

C.  $\frac{10}{9}$

D.  $\frac{10}{7}$

**Answer: C**



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8. The number of boys is more than the number of girls by 12% of the total strength of the class. The ratio of the number of boys to that of the girls is

A. 11:14

B. 14:11

C. 25:28

D. 28:25

**Answer: B**



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9. The ratio of the number of ladies to that of gents at a party was 3: 2 when 20 more gents joined the party, the ratio was reversed . The number of ladies presents at the party was

A. 36

B. 32

C. 24

D. 16

**Answer: C**



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10. The ratio of the ages of two boys is 5 : 6

After 2 years, the ratio of their ages will be 7: 8

The ratio of their ages after 10 years will be

A. 15: 16

B. 17: 18

C. 11: 12

D. 22: 24

**Answer: A**





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11. the sum of three number is 116. the ratio of the second to the third is 9: 16 and the first to third is 1 : 4 The second number is

A. 30

B. 32

C. 34

D. 36

**Answer: D**



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**12.** A man encashes a cheque of 600 from a bank. The bank pays him money in 10 rupee notes and 5 rupee notes only, totalling 72. The ratio of the number of · 10 rupee notes to that of 5 rupee notes is

A. 1 : 2

B. 2 : 1

C. 2 : 3

D. 3 : 2

**Answer: B**



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**13.** If 372 coins-consist.of one rupee, 50 paise and 25 paise coins whose values are in the ratio 13:11:7, then the number of 50 paise coins will be

A. 132

B. 128

C. 136

D. 133

**Answer: A**



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**14.** An amount of money is to be divided among P, Q and R in the ratio 4:7:9. If the difference between the shares of Q and R is 500, what will be the difference between the shares of P and Q?

A. ₹ 500

B. ₹ 1000

C. ₹ 750

D. ₹ 850

**Answer: C**



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**15.** The ratio of A to B is 4:5 and that of B to C is 2:3. If A equals 800, then C equals

A. 1000

B. 1200

C. 1500

D. 2000

**Answer: C**



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**16.** In a examination , the number of those who passed and the number of those who failed were in the ratio  $25:4$  .If five more had appeared and the number of failures were 2 less than earlier , the ratio of students who failed would have

been 22:3 . Find the total number who appeared at the examination .

A. 145

B. 150

C. 155

D. 180

**Answer: A**



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17. The incomes of A and B are in the ratio 5:3.

The expenses of A, B and C are in the ratio 8:5:2.

If C spends 2000 and B saves 700, then A saves

A. ₹ 1500

B. ₹ 1000

C. ₹ 500

D. ₹ 250

**Answer: A**



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**18.** The speeds of three cars are in the ratio 2:3 : 4. What is the ratio between the times taken by these cars to travel the same distance?

A. 4 : 3 : 2

B. 2 : 3 : 4

C. 4 : 9 : 16

D. 6 : 4 : 3

**Answer: D**



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19. The sum of the squares of three numbers which are in the ratio 2:3:4 is 725. What are these numbers?

A. 10, 15, 20

B. 14, 21, 28

C. 20, 15, 30

D. 20, 30, 40

**Answer: A**



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20. 2430 are distributed among three persons so that their shares be diminished by 5, 10 and 15 respectively, the remainder shall be in the ratio 3:4:5. The share of C is

A. ₹ 1015

B. ₹ 605

C. ₹ 810

D. ₹ 1415

**Answer: A**



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21. Ex. 5: Three persons A, B, C whose salaries together amount to 14,400, spend 80%, 85% and 75% of their salaries respectively. If their savings are in the ratio 8 : 9 : 20, find their respective salaries.

A. ₹ 3000, ₹ 5000, ₹ 6400

B. ₹ 3400, ₹ 4800, ₹ 6200

C. ₹ 3200, ₹ 4800, ₹ 6400

D. ₹ 3000, ₹ 5200, ₹ 6200

**Answer: C**



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**22.** A pot contains 81 litres of pure milk.  $\frac{1}{3}$  of the milk is replaced by the same amount of water. Again of the mixture is replaced by that amount of water. The ratio of milk and water in the new mixture is

A. 1 : 2

B. 1 : 1

C. 2:1

D. 4:5

**Answer: D**



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**23.** A mixture contains milk and water in the ratio 5:1. On adding 5 litres of water, the ratio of milk to water becomes 5:2. The quantity of milk in the original mixture is

A. 16 litres

B. 22.75 litres

C. 25 litres

D. 32.5 litres

**Answer: C**



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**24.** If 2 kg of metal of which  $\frac{1}{3}$  is zinc and rest copper be mixed with 3 kg of metal of which is  $\frac{1}{4}$  zinc and rest copper, what is the ratio of zinc to copper in the mixture?

A. 13: 35

B. 12: 30

C. 15: 40

D. 17: 43

**Answer: D**



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**25.** The number of employees in companies A, B and C are in the ratio 3:2: 4 respectively. If the number of employees in the three companies is



increased by 20%, 30% and 15% respectively, what will be the new ratio of employees working in companies A, B and C respectively?

A. 18: 13: 24

B. 13: 18: 23

C. 17: 13: 23

D. 18: 13: 23

**Answer: D**



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**26.** The ratio of a 2-digit number to the sum of its digits is 7: 1. If the digit in the ten's place is 1 more than the digit in the one's place, then the number is

A. 65

B. 43

C. 32

D. 21

**Answer: D**



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27. The ratio of number of boys to that of girls in a group becomes 2 : 1 when 15 girls leave. But, afterward 5 when 45 boys also leave, the ratio becomes 1. Originally the number of girls in the group was 20 b. 30 c. 40 d. 50

A. 20

B. 30

C. 40

D. 50

**Answer: C**



**28.** A grocer buys kinds of rice X and Y, one (X) at the rate of  $a$  per kg and the other (Y) at the rate of  $\text{₹ } b$  per kg. He mixes them and obtains a mixture of  $\text{₹ } c$  per kg. What is the ratio of the variety X to that of variety Y in the mixture?

A.  $(b+c) : (c + a)$

B.  $(b-c) : (c + a)$

C.  $(b-c) : (c-a)$

D.  $(b+c) : (c-a)$

**Answer: C**



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**29.** The ratio of the first and second class train fares between two stations is  $3 : 1$  and that of the numbers of passengers travelling between the two stations by first and second classes is  $1:50$ . If on a particular day, Rs 1,325 is collected from passengers travelling between the two stations then the amount collected from the second class passengers is :

A. ₹ 1250

B. ₹ 1000

C. ₹ 850

D. ₹ 750

**Answer: A**



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**30.** Two liquids A and B are in the ratio 5:1 in container 1 and 1:3 in container 2. In what ratio should the contents of the two containers be

mixed so as to obtain a mixture of A and B in the ratio 1 : 1?

A. 2 : 3

B. 4 : 3

C. 3 : 2

D. 3 : 4

**Answer: D**



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**31.** If  $a : b = 3 : 4$  and  $b : c = 8 : 9$ , then  $a : c = ?$

A. 1:2

B. 3:2

C. 1:3

D. 2:3

**Answer: D**



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32. If  $\frac{1}{x} : \frac{1}{y} : \frac{1}{z} = 2:3:5$  then determine  $x : y : z$

A. 2:3:5



B. 15: 10: 16

C. 5: 3: 2

D. 6: 10: 15

**Answer: B**



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**33.** Two numbers are in the ratio  $1\frac{1}{2} : 2\frac{2}{3}$ . When each of these is increased by 15, their ratio becomes  $1\frac{2}{3} : 2\frac{1}{2}$ . The greater of the number is  
27 b. 28 c. 36 d. 64

A. 27

B. 36

C. 48

D. 64

**Answer: C**



**Watch Video Solution**

**34.** The total value of a collection of coins of denominations Re 1, 50-paise, 25-paise, 10-paise and 5-paise is Rs 380. If the number of coins of

each denomination is the same, then the number of one-rupee coins is (a) 160 (b) 180 (c) 200 (d) 220

A. 160

B. 180

C. 200

D. 220

**Answer: C**



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35. A flagstaff 17.5 m high casts a shadow of length 40.25 m. The height of the building, which casts a shadow, of length 28.75 m under similar conditions will be 10 m b. 12.5 m c. 17.5 m d. 21.25 m

A. 10 m

B. 12.5m

C. 17.5m

D. 21.25m

**Answer: B**



**Watch Video Solution**

36. If  $x : y = 3 : 4$  , then  $(2x + 3y) : (3y - 2x) = ?$

A. 2 : 1

B. 3 : 2

C. 3 : 1

D. 21 : 1

**Answer: C**



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37. By mistake ,instead of dividing Rs.117 among A,B and C in the ratio  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$  It was divided in the ratio of 2:3:4. who gains the most and by how much?

A. A, rupees 28

B. B, rupees 3

C. C, rupees 20

D. C, rupees 25

**Answer: D**



**Watch Video Solution**

**38.** The students in three classes are in the ratio 2:3:5. If 40 students are increased in each class, the ratio changes to 4 : 5:7. Originally the total number of students was

A. 100

B. 180

C. 200

D. 400

**Answer: C**



**Watch Video Solution**

39. If  $x : y = 7 : 3$ , then the value of  $\frac{xy + y^2}{x^2 - y^2}$  is:

A.  $\frac{3}{4}$

B.  $\frac{4}{3}$

C.  $\frac{3}{7}$

D.  $\frac{7}{3}$

**Answer: A**



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**40.** rupees 750 is divided among A , B and C in such a manner that  $A : B = 5 : 2$  and  $B : C = 7 : 13$   
what is A's share

A. rupees 350

B. rupees 260

C. rupees 140

D. rupees 250

**Answer: A**



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## Self Assessment Sheet 15

1. If  $a : b = 2 : 3$  ,  $b : c = 2 : 4$ , then  $a : b : c = ?$

A. 4 : 6 : 12

B. 6 : 1 : 5

C. 5 : 6 : 2

D. 7 : 1 : 2

**Answer: A**



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2. If  $\frac{1}{x} : \frac{1}{y} : \frac{1}{z} = 2 : 3 : 5$ , then  $x : y : z = ?$

A. 2 : 3 : 5

B. 15 : 10 : 6

C. 5 : 3 : 2

D. 6 : 10 : 15

**Answer: B**



**Watch Video Solution**

3. Two numbers are in the ratio  $1\frac{1}{2} : 2\frac{2}{3}$ . When each of these is increased by 15, their ratio becomes  $1\frac{2}{3} : 2\frac{1}{2}$ . The greater of the number is  
27 b. 28 c. 36 d. 64

A. 27

B. 36

C. 48

D. 64

**Answer: C**



**Watch Video Solution**

4. The total value of a collection of coins of denominations Re 1, 50-paise, 25-paise, 10-paise and 5-paise is Rs 380. If the number of coins of each denomination is the same, then the number of one-rupee coins is (a) 160 (b) 180 (c) 200 (d) 220

A. 160

B. 180

C. 200

D. 220

**Answer:**



**Watch Video Solution**

5. A flagstaff 17.5 m high casts a shadow of length 40.25 m. The height of the building, which casts a shadow, of length 28.75 m under similar conditions will be 10 m b. 12.5 m c. 17.5 m d. 21.25 m

A. 10 m

B. 12.5 m

C. 17.5 m

D. 21. 25m

**Answer: B**



**Watch Video Solution**

**6. If  $x : y = 3 : 4$ , then  $(2x + 3y) : (3y - 2x) = ?$**

A. 2 : 1

B. 3 : 2

C. 3 : 1

D. 21 : 1

**Answer: C**



**Watch Video Solution**

7. By mistake ,instead of dividing Rs.117 among A,B and C in the ratio  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$  It was divided in the ratio of 2:3:4. who gains the most and by how much?

A. A, rupes 28

B. B, rupes 3



C. C, rupees 20

D. C, rupees 25

**Answer:**



**Watch Video Solution**

**8.** The students in three classes are in the ratio 2:3:5. If 40 students are increased in each class, the ratio changes to 4 : 5:7. Originally the total number of students was

A. 100

B. 180

C. 200

D. 400

**Answer: C**



**Watch Video Solution**

9. If  $x : y = 7 : 3$ , then the value of  $\frac{xy + y^2}{x^2 - y^2}$  is:

A.  $\frac{3}{4}$

B.  $\frac{4}{3}$

C.  $\frac{3}{7}$

D.  $\frac{7}{3}$

**Answer: A**



**Watch Video Solution**

**10.** rupees 750 is divided among A , B and C in such a manner that  $A : B = 5 : 2$  and  $B : C = 7 : 13$

How much is C's share more than B's share

A. rupees 50

B. rupees 130

C. rupes 120

D. rupes 150

**Answer: C**



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