

Ratio

[CONTENTS](#)

Worked example

Simplify:

9: 12

10: 12

12: 12

13: 12

24: 12

Your turn

Simplify:

12: 16

3: 4

14: 16

7: 8

16: 16

1: 1

17: 16

17: 16

24: 16

3: 2

Worked example

Simplify:

9: 12: 18

10: 12: 18

10: 18: 18

10: 11: 18

Your turn

Simplify:

12: 16: 20

3: 4: 5

14: 16: 20

7: 8: 9

16: 16: 20

4: 4: 5

9: 16: 20

9: 16: 20

Worked example

Amounts of liquid A and liquid B are in the ratio 2: 5

Scenario 1

There are 20 litres of A.

How many litres of B are there?

Scenario 2

There are 20 litres of B.

How many litres of A are there?

Your turn

Amounts of liquid A and liquid B are in the ratio 5: 3

Scenario 1

There are 30 litres of A.

How many litres of B are there?

18

Scenario 2

There are 30 litres of B.

How many litres of A are there?

50

Worked example

The ratio of blue and red counters in a bag is 4: 3.

What fraction of the counters are blue?

What fraction of the counters are red?

Your turn

The ratio of blue and red counters in a bag is 5: 7.

What fraction of the counters are blue?

$$\frac{5}{12}$$

What fraction of the counters are red?

$$\frac{7}{12}$$

Worked example

The ratio of blue, red and yellow counters in a bag is 4: 3: 7.

What fraction of the counters are blue?

What fraction of the counters are red?

What fraction of the counters are yellow?

Your turn

The ratio of blue, red and yellow counters in a bag is 5: 7: 3.

What fraction of the counters are blue?

$$\frac{1}{3}$$

What fraction of the counters are red?

$$\frac{7}{15}$$

What fraction of the counters are yellow?

$$\frac{1}{5}$$

Worked example

Red and blue paint are mixed in the ratio 3: 1.

y is the amount of red paint

x is the amount of blue paint

Write an equation for y in terms of x

Your turn

Red and blue paint are mixed in the ratio 2: 1.

y is the amount of red paint

x is the amount of blue paint

Write an equation for y in terms of x

$$y = 2x$$

Worked example

Red and blue paint are mixed in the ratio 1: 3.

y is the amount of red paint

x is the amount of blue paint

Write an equation for y in terms of x

Your turn

Red and blue paint are mixed in the ratio 1: 2.

y is the amount of red paint

x is the amount of blue paint

Write an equation for y in terms of x

$$y = \frac{1}{2}x$$

Worked example

Divide:

24 in the ratio 3: 1

24 in the ratio 3: 5

24 in the ratio 7: 5

Your turn

Divide:

36 in the ratio 2: 7

8: 28

Worked example

Divide:

24 in the ratio 3: 1: 2

24 in the ratio 3: 5: 4

24 in the ratio 7: 5: 0

Your turn

Divide:

36 in the ratio 2: 7: 3

6: 21: 9

Worked example

A and B share some money in the ratio 2: 5

Scenario 1

A gets £15 less than B.
How much does A get?

Scenario 2

B gets £30 more than A.
How much does B get?

Your turn

A and B share some money in the ratio 5: 3

A gets £14 more than B.
How much does A get?

£35

Worked example

A, B and C share some money in the ratio 2: 4: 7

Scenario 1

C gets £15 more than A.
How much does B get?

Scenario 2

C gets £15 more than B.
How much does A get?

Your turn

A, B and C share some money in the ratio 3: 6: 4

B gets £15 more than A.
How much does C get?

£20

Worked example

Person A and Person B share oranges in the ratio 3: 5

If A gets 30, how many does B get?

If B gets 30, how many does A get?

Your turn

Person A and Person B share oranges in the ratio 7: 4

If A gets 28, how many does B get?

16

If B gets 28, how many does A get?

49

Worked example

Persons A, B and C share some money.

A gets $\frac{7}{10}$ of the money.

B and C share the remainder in the ratio 2:3

What is B's share of the money?

Your turn

Persons A, B and C share some money.

A gets $\frac{3}{10}$ of the money.

B and C share the remainder in the ratio 3:2

What is B's share of the money?

$$\frac{14}{50} = \frac{7}{25}$$

Worked example

A, B and C share £120.
A gets three times as much as B.
C gets twice as much as A.
How much does A get?

Your turn

A, B and C share £120.
A gets twice as much as B.
B gets three times as much as C.
How much does A get?

£60

Worked example

On a school trip:

The ratio of the number of teachers to the number of students is 1: 10

The ratio of the number of male students to the number of female students is 5: 7

What percentage of people on the trip are female students?

Your turn

On a school trip:

The ratio of the number of teachers to the number of students is 1: 15
The ratio of the number of male students to the number of female students is 7: 5

What percentage of people on the trip are female students?

39%

Worked example

On a school trip:

The ratio of the number of teachers to the number of students is 1: 10

The ratio of the number of male students to the number of female students is 5: 7

What fraction of people on the trip are female students?

Your turn

On a school trip:

The ratio of the number of teachers to the number of students is 1: 15
The ratio of the number of male students to the number of female students is 7: 5

What fraction of people on the trip are female students?

$$\frac{39}{100}$$

Worked example

The ratio of A to B is 3: 5.
The ratio of B to C is 5: 2.
What is the ratio of A to C ?

Your turn

The ratio of A to B is 3: 4.
The ratio of B to C is 4: 5.
What is the ratio of A to C ?

3: 5

Worked example

The ratio of A to B is $3:5$.
The ratio of B to C is $7:2$.
What is the ratio of A to C ?

Your turn

The ratio of A to B is $3:4$.
The ratio of B to C is $7:5$.
What is the ratio of A to C ?

21:20

Worked example

In a box, there are:

- Two times as many red counters as blue counters
- Three times as many blue counters as red counters

Write the ratio of the number of red pens to the number of green pens to the number of blue pens

Your turn

In a box, there are:

- Three times as many red counters as blue counters
- Two times as many blue counters as red counters

Write the ratio of the number of red pens to the number of green pens to the number of blue pens

6: 2: 1

Worked example

A person has only 5p and 10p coins.
The ratio of the number of 5p coins to the number of 10p coins is 4: 5.
Work out the ratio of

The total value of the 5p coins : the total value of the 10p coins

Your turn

A person has only 5p and 10p coins.
The ratio of the number of 5p coins to the number of 10p coins is 2: 7.
Work out the ratio of

The total value of the 5p coins : the total value of the 10p coins

1: 7

Worked example

A person has only 5p and 10p coins.
The ratio of the number of 5p coins to the number of 10p coins is 3: 5.
Work out the ratio of

The total value of the 5p coins : the total value of the 10p coins

Your turn

A person has only 5p and 10p coins.
The ratio of the number of 5p coins to the number of 10p coins is 5: 7.
Work out the ratio of

The total value of the 5p coins : the total value of the 10p coins

5: 14

Worked example

Persons A and B share money in the ratio 7: 2

Persons C and D share twice as much money as A and B share

Persons C and D share money in the ratio 1: 3

A receives $\pounds a$, B receives $\pounds b$, C receives $\pounds c$, D receives $\pounds d$

Write $a: b: c: d$ in its simplest form.

Your turn

Persons A and B share money in the ratio 2: 5

Persons C and D share twice as much money as A and B share

Persons C and D share money in the ratio 3: 1

A receives $\pounds a$, B receives $\pounds b$, C receives $\pounds c$, D receives $\pounds d$

Write $a: b: c: d$ in its simplest form.

4: 10: 21: 7

Worked example

The ratio of blue and red counters in a bag is 4: 3.

Six blue counters are added.

The ratio is now 7: 3.

How many counters were in the bag originally?

Your turn

The ratio of blue and red counters in a bag is 4: 3.

Six red counters are added.

The ratio is now 4: 5.

How many counters were in the bag originally?

21

Worked example

The ratio of blue and red counters in a bag is 4: 3.

Six blue counters are added.

The ratio is now 2: 1.

How many counters were in the bag originally?

Your turn

The ratio of blue and red counters in a bag is 4: 3.

Six red counters are added.

The ratio is now 8: 9.

How many counters were in the bag originally?

28

Worked example

The ratio of A's age to B's age is
2: 5

In 4 years time the ratio will be
5: 11.

How old is B ?

Your turn

The ratio of A's age to B's age is
3: 4

In 7 years time the ratio will be
4: 5.

How old is B ?

28 years old

Worked example

Work out the ratio $x:y$

$$x^2 - 4y^2 = 0$$

$$x^2 - 25y^2 = 0$$

Your turn

Work out the ratio $x:y$

$$x^2 - 9y^2 = 0$$

3:1

Worked example

The ratio of blue and red counters in a bag is 4: 3.

A counter is taken out of the bag at random.

What is the probability that the counter is blue?

What is the probability that the counter is red?

Your turn

The ratio of blue and red counters in a bag is 5: 7.

A counter is taken out of the bag at random.

What is the probability that the counter is blue?

$$\frac{5}{12}$$

What is the probability that the counter is red?

$$\frac{7}{12}$$

Worked example

The ratio of blue, red and yellow counters in a bag is 4: 3: 7.
A counter is taken out of the bag at random.

What is the probability that the counter is blue?

What is the probability that the counter is red?

What is the probability that the counter is red?

Your turn

The ratio of blue, red and yellow counters in a bag is 5: 7: 3.
A counter is taken out of the bag at random.

What is the probability that the counter is blue? $\frac{1}{3}$

What is the probability that the counter is red? $\frac{7}{15}$

What is the probability that the counter is red? $\frac{1}{5}$

Worked example

The average exchange rate for Pound to Yen in June 2020 was 1: 132

How much would I get in return for exchanging:

£10

¥660

Your turn

The exchange rate for Pound to Yen in June 2020 was 1: 132

How much would I get in return for exchanging:

£20

¥2640

¥6600

£50

Worked example

The average exchange rates in June 2020 were:

Pound : Japanese Yen
1 : 132

Pound : American dollar
1 : 1.25

The same item costs 1000 Yen in Tokyo and \$10.50 in New York.

Which city is selling the item for the best value?

Your turn

The average exchange rates in June 2020 were:

Pound : Japanese Yen
1 : 132

Pound : American dollar
1 : 1.25

The same item costs 1500 Yen in Tokyo and \$14.25 in New York.

Which city is selling the item for the best value?

Tokyo

Worked example

A map is scaled down so that 5 centimetres on the map represents a real distance of 1 kilometer.

On the map, the distance between two points is 41 cm.

Work out the real distance between these two points.

Your turn

A map is scaled down so that 4 centimetres on the map represents a real distance of 1 kilometer.

On the map, the distance between two points is 14 cm.

Work out the real distance between these two points.

3.5 km

Worked example

A map is scaled down so that 5 centimetres on the map represents a real distance of 1 kilometer.

On the map, the distance between two points is 41 cm.

Work out the scale of the map in the form $1:n$.

Your turn

A map is scaled down so that 4 centimetres on the map represents a real distance of 1 kilometer.

On the map, the distance between two points is 14 cm.

Work out the scale of the map in the form $1:n$.

1: 25000