



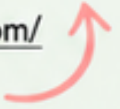
JP Maths

Revision



Attempt the paper
before watching the
solutions!

[https://www.youtube.com/
@JPMathsRevision](https://www.youtube.com/@JPMathsRevision)



FOUNDATION / HIGHER TIER

Ratio



INSTRUCTIONS

- Use **black ink** or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



INFORMATION

- The marks for **each** question are shown in brackets– *use this as a guide as to how much time to spend on each question.*



ADVICE

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.



You've got this!

1. A bag contains 8 red counters and 12 blue counters.

Write down the ratio of red counters to blue counters.

Give your answer in its simplest form.

$$\begin{array}{l} R:B \\ 8:12 \end{array}$$

$$2:3$$

(Total for Question 1 is 2 marks)

2. A fruit bowl contains 6 apples, 9 bananas and 15 oranges.

Write the ratio of apples : bananas : oranges

Give your answer in its simplest form.

$$\begin{array}{l} 6:9:15 \\ 2:3:5 \end{array}$$

$$2:3:5$$

(Total for Question 2 is 2 marks)

3. A class contains 18 boys and 24 girls.

Write the ratio of boys to girls in its simplest form.

$$18:24$$

$$3:4$$

(Total for Question 3 is 2 marks)

4. A recipe uses 300 g flour, 180 g butter and 120 g sugar.

Write the ratio flour : butter : sugar

Give your answer in its simplest form.

$$300 : 180 : 120$$

$$30 : 18 : 12$$

$$5 : 3 : 2$$

$$5 : 3 : 2$$

(Total for Question 4 is 2 marks)

5. A bottle contains 1.5 litres of orange juice and 900 ml of apple juice.

Write the ratio of orange juice to apple juice in its simplest form.

$$1500 : 900$$

$$15 : 9$$

$$5 : 3$$

$$5 : 3$$

(Total for Question 5 is 2 marks)

6. A ribbon is cut into lengths of 80 cm and 1.2 m.

Write the ratio of the two lengths in its simplest form.

$$80 : 120$$

$$2 : 3$$

$$2 : 3$$

(Total for Question 6 is 2 marks)

7. A recipe uses $\frac{3}{4}$ litre of milk and $\frac{1}{2}$ litre of cream.

Write the ratio of milk to cream in its simplest form.

$$\frac{3}{4} : \frac{1}{2}$$

$$\frac{3}{4} : \frac{2}{4}$$

$$3:2$$

(Total for Question 7 is 2 marks)

8. A class contains 12 girls and 18 boys.

a) Write the ratio of girls to boys in its simplest form.

$$12:18$$

$$2:3$$

b) What fraction of the class are girls?

(1)

$$\frac{2}{5}$$

c) What percentage of the class are boys?

(1)

$$\frac{3}{5} = \frac{60}{100}$$

$$60\%$$

(1)

(Total for Question 8 is 3 marks)

9. The ratio of cats to dogs at an animal rescue centre is 3 : 5.

a) What fraction of the animals are cats?

$$\frac{3}{8}$$

(1)

b) What percentage of the animals are dogs?

$$\frac{5}{8} = 0.625$$

$$62.5\%$$

(1)

(Total for Question 9 is 2 marks)

10. Emily and Jack share £42 in the ratio 2 : 5.

Work out how much each person receives.

$$\begin{array}{l} E : J \\ 2 : 5 \rightarrow 7 \\ \times 6 \left[\begin{array}{l} 12 : 30 \rightarrow 42 \end{array} \right] \times 6 \end{array}$$

Emily : £12

Jack : £30

(Total for Question 10 is 2 marks)

11. Three friends share 90 sweets in the ratio 2 : 3 : 4.

Work out how many sweets each friend receives.

$$\begin{array}{l} 2:3:4 \rightarrow 9 \\ 20:30:40 \rightarrow 90 \end{array} \Bigg] \times 10$$

1. 20
2. 30
3. 40

(Total for Question 11 is 2 marks)

12. A farmer shares 144 kg of animal feed between sheep and goats in the ratio 5 : 3.

Work out how much feed the goats receive.

$$\begin{array}{l} S:G \\ 5:3 \rightarrow 8 \\ 90:54 \rightarrow 144 \end{array} \Bigg] \times 18$$

54 kg

(Total for Question 12 is 2 marks)

13. A school buys 180 exercise books for Year 10 and Year 11.

The books are shared in the ratio 4 : 5.

How many books does each year group receive?

$$\begin{array}{l} 4:5 \rightarrow 9 \\ 80:100 \rightarrow 180 \end{array} \Bigg] \times 20$$

Yr 10 : 80
Yr 11 : 100

(Total for Question 13 is 2 marks)

14. A charity receives £1800 in donations.

The money is shared between three community projects in the ratio 6 : 5 : 4.

Work out how much each project receives.

$$\begin{array}{l} 6:5:4 \rightarrow 15 \\ \times 120 \left[\begin{array}{l} 720:600:480 \end{array} \right] \times 120 \end{array}$$

1. 720
2. 600
3. 480

(Total for Question 14 is 2 marks)

15. A fruit smoothie is made by mixing strawberries and bananas in the ratio 5 : 3.

Tom uses 20 strawberries.

How many bananas does he need?

$$\begin{array}{l} S:B \\ 5:3 \\ \times 4 \left[\begin{array}{l} 20:12 \end{array} \right] \times 4 \end{array}$$

12

(Total for Question 15 is 2 marks)

16. The ratio of boys to girls in a class is 4 : 5.

There are 24 boys.

How many girls are there?

$$\begin{array}{l} B:G \\ 4:5 \\ \times 6 \left[\begin{array}{l} 24:30 \end{array} \right] \times 6 \end{array}$$

30

(Total for Question 16 is 2 marks)

17. Blue paint and white paint are mixed in the ratio 7 : 2.

An artist uses 56 litres of blue paint.

How much white paint does she need?

$$\begin{array}{r} \text{B:W} \\ 7:2 \\ \times 8 \quad \left[\begin{array}{l} 56:16 \end{array} \right] \end{array}$$

16 litres

(Total for Question 17 is 2 marks)

18. The ratio of cats to dogs at an animal rescue centre is 9 : 5.

There are 45 dogs.

How many cats are there?

$$\begin{array}{r} \text{C:D} \\ 9:5 \\ \times 9 \quad \left[\begin{array}{l} 81:45 \end{array} \right] \times 9 \end{array}$$

81

(Total for Question 18 is 2 marks)

19. The ratio of length to width of a rectangle is 8 : 5.

The width is 30 cm.

Find the length.

$$\begin{array}{r} \text{L:W} \\ 8:5 \\ \times 6 \quad \left[\begin{array}{l} 48:30 \end{array} \right] \times 6 \end{array}$$

48 cm

(Total for Question 19 is 2 marks)

20. $A : B = 2 : 5$
 $B : C = 5 : 7$
 Find $A : B : C$.

$$\begin{array}{l} A : B : C \\ 2 : 5 : \\ : 5 : 7 \\ 2 : 5 : 7 \end{array}$$

$$2 : 5 : 7$$

(Total for Question 20 is 2 marks)

21. $A : B = 4 : 3$
 $B : C = 6 : 5$
 Find $A : B : C$.

$$\begin{array}{l} A : B : C \\ 4 : 3 \\ : 6 : 5 \\ \hline 8 : 6 : 5 \end{array}$$

$$8 : 6 : 5$$

(Total for Question 21 is 2 marks)

22. Red : Blue = 5 : 4
 Blue : Green = 6 : 7
 Find Red : Blue : Green.

$$\begin{array}{l} R : B : G \\ 5 : 4 \\ 6 : 7 \\ \hline 15 : 12 : 14 \end{array}$$

$$15 : 12 : 14$$

(Total for Question 22 is 2 marks)

23. Boys : Girls = 5 : 6

Girls : Teachers = 9 : 2

Find Boys : Girls : Teachers.

$$\begin{array}{r} B : G : T \\ 5 : 6 : \\ : 9 : 2 \\ \hline 15 : 18 : 4 \end{array}$$

$$15 : 18 : 4$$

(Total for Question 23 is 2 marks)

24. A wildlife reserve has deer and foxes in the ratio 5 : 3.

There are 144 animals altogether.

Work out how many deer there are.

$$\begin{array}{l} D : F \\ 5 : 3 \rightarrow 8 \\ \times 18 \left[\begin{array}{l} 90 : 54 \rightarrow 144 \end{array} \right] \times 18 \end{array}$$

$$90$$

(Total for Question 24 is 2 marks)

25. A company produces silver and gold medals in the ratio 7 : 4.

There are 36 more silver medals than gold medals.

How many medals are produced altogether?

$$84 + 48$$

$$\begin{array}{l} S : G \rightarrow \text{diff} \\ 7 : 4 \rightarrow 3 \\ \times 12 \left[\begin{array}{l} 84 : 48 \quad 36 \end{array} \right] \times 12 \end{array}$$

$$132$$

(Total for Question 25 is 2 marks)

26. A camping shop sells adult and children's sleeping bags.

The ratio of adult sleeping bags sold to children's sleeping bags sold is 9 : 5.

The shop sells 99 adult sleeping bags.

How many children's sleeping bags are sold?

9:5
99:55

55

(Total for Question 26 is 2 marks)

27. A model railway is built using straight track and curved track in the ratio 8 : 3.

The layout contains 77 pieces of track altogether.

How many curved pieces are used?

S:C
8:3 → 11
x7 { 56:21 → 77 } x7

21

(Total for Question 27 is 2 marks)

28. A bird feeder contains only sunflower seeds and peanuts.

The ratio of sunflower seeds to peanuts is 11 : 6.

There are 45 more sunflower seeds than peanuts.

How many seeds are there altogether?

S:P diff
11:6 → 5
x9 { 99:54 45 } x9

+ 99
54
153

153

(Total for Question 28 is 2 marks)

29. A farmer mixes grass seed, wildflower seed and fertiliser in the ratio

6 : 2 : 1.

He has

- 960 g grass seed
- 250 g wildflower seed
- 180 g fertiliser

What is the greatest amount of mixture he can make?

$$\begin{array}{l} G:W:F \\ 6:2:1 \\ 750:250:125 \end{array} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \times 125$$

$$\begin{array}{r} 750 \\ 250 \\ 125 \end{array}$$

$$1125 \text{ g}$$

(Total for Question 29 is 3 marks)

30. Daniel receives £200 birthday money.

He saves 35% of it.

He spends the rest.

The ratio of the amount spent on clothes to the amount spent on everything else is 3 : 5.

Work out how much Daniel spends on clothes.

$$35\% \text{ of } 200 = £70$$

$$£130 \text{ Spent}$$

$$\begin{array}{l} C:E \\ 3:5 \rightarrow 8 \\ \times 16.25 \left[\begin{array}{l} 48.75: \\ \rightarrow 130 \end{array} \right] \times 16.25 \end{array}$$

$$£48.75$$

(Total for Question 30 is 3 marks)

31. A warehouse stores small, medium and large boxes.

There are 480 boxes altogether.

25% are small.

40% are medium.

The rest are large.

Work out the ratio of medium boxes to large boxes.

$$\begin{aligned} 25\% &= 120 \text{ S} \\ 40\% &= 192 \text{ M} \\ &= 168 \text{ L} \end{aligned}$$

$$\begin{aligned} 192 &: 168 \\ 96 &: 84 \\ &\vdots \\ 8 &: 7 \end{aligned}$$

$$8:7$$

(Total for Question 31 is 3 marks)

32. A garden centre sells small and large bags of compost.

A small bag contains 25 litres.

A large bag contains 60 litres.

The ratio of the number of small bags sold to the number of large bags sold is 7 : 4.

A total of 2,075 litres of compost is sold.

Work out how many small bags were sold.

$$\begin{aligned} 25 \times 7 &= 175 \text{ S} \\ 60 \times 4 &= 240 \text{ L} \\ &\times 5 \left[\begin{array}{l} 175 : 240 \rightarrow 415 \\ 875 : 1200 \rightarrow 2075 \end{array} \right] \times 5 \\ 875 \div 25 &= 35 \end{aligned}$$

$$35$$

(Total for Question 32 is 4 marks)

33. A football academy has only Under 15 and Under 16 players.

The ratio of Under 15 players to Under 16 players is 8 : 11.

Twenty-two Under 16 players leave.

The ratio is now 8 : 9.

Work out how many players were originally at the academy.

$$\begin{array}{l|l} 8x \text{ (<15)} & 8y \text{ (<15)} \\ 11x \text{ (<16)} & 9y \text{ (<16)} \end{array}$$

$$11x - 22 = 9y$$

$$8x = 8y \Rightarrow x = y$$

$$11x - 22 = 9x$$

$$2x - 22 = 0 \Rightarrow x = 11$$

$$8(11) + 11(11)$$

$$88 + 121$$

209

(Total for Question 33 is 4 marks)

34. Three cyclists, Ethan, Lucas and Mia, win a cash prize of £5250.

The ratio of the amount Ethan receives to the amount Lucas receives is 6 : 5.

Mia receives twice as much as Lucas.

Work out how much Lucas receives.

$$E:L:M$$

$$6:5:10$$

$$:1250:$$

$$\rightarrow 21$$

$$5250 \div 21 \times 250$$

1250

(Total for Question 34 is 3 marks)

35. A charity collection contains only £2 coins and 50p coins.

The ratio of the number of £2 coins to the number of 50p coins is 4 : 7.

The total value of the coins is £92.

Work out how many £2 coins there are.

$$\begin{array}{l} 8 : 3.50 \rightarrow 11.50 \\ \times 8 \quad \left[\begin{array}{l} 64 : 28 \\ 92 \end{array} \right] \times 8 \end{array}$$

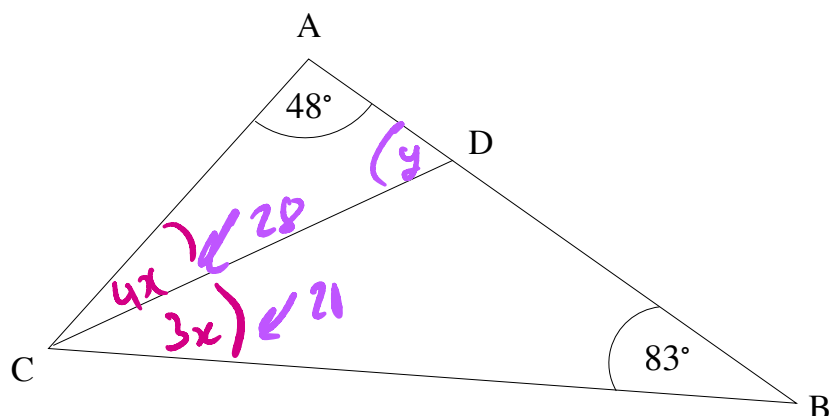
$$64 \div 2 = 32$$

32

(Total for Question 35 is 4 marks)

36. Triangle ABC is shown below.

D lies on AB.



$$\angle ACD : \angle BCD = 4 : 3$$

Work out the size of $\angle ADC$.

$$48 + 83 = 131$$

$$180 - 131 = 49$$

$$49 \div 7 = 7$$

$$180 - 48 - 28 = 104^\circ$$

104°

(Total for Question 36 is 4 marks)