Smart Cub Learning

11+ TOPIC PACK

Ratio and Proportion

Maths

60 questions from warm-up to exam level, with worked solutions

SAMPLE

Smart Cub Learning topic packs are original practice material. We are not affiliated with GL Assessment, CEM, Quest Assessments, Kent County Council or any school.

How to do it

A ratio compares two amounts. The ratio 1:4 means 1 part of one thing for every 4 parts of another. Ratios help you share things out and scale amounts up, as in a recipe.

Learn the method

1. Read the question twice. Write down the ratio and the number you are given.
2. Sharing a total: add the parts of the ratio. This tells you how many equal parts there are.
3. Scaling up: ask how many lots of the first amount fit into the number you are given. That number is the multiplier.
4. Sharing: divide the total by the number of parts to find one part. Then multiply by the parts you want. Scaling: multiply the second amount by the multiplier.
5. Check your answer. For sharing, both shares must add up to the total. For scaling, the two amounts must still be in the same ratio.

Worked example 1

A total of 20 buttons is shared between Callum and Devi in the ratio 1:4. How many buttons does Callum get?

A 4 **B** 16 **C** 8 **D** 10

How to work it out

1. The ratio 1:4 means 5 equal parts in total (1 + 4 = 5).
2. One part is 20 ÷ 5 = 4 buttons.
3. Callum gets 1 part, so Callum gets 4 buttons.

The answer is A: 4

Worked example 2

A recipe uses 2 oranges for every 3 plums. How many plums are needed for 10 oranges?

A 18 **B** 12 **C** 15 **D** 10

How to work it out

1. 10 oranges is 5 lots of 2 oranges, because 10 ÷ 2 = 5.
2. So you need 5 lots of 3 plums.
3. 5 × 3 = 15 plums.

The answer is C: 15

★ Top Tip

Draw a bar and split it into equal boxes, one box for each part. Write the total above it. This makes the parts easy to see.

▲ Watch Out

- Do not divide the total by one number from the ratio. First add the parts together. Then divide the total by that number of parts.
- Do not add the same number to both amounts when you scale up. Multiply both amounts by the same number instead.

Exam Tip

In a sharing question, one wrong answer is often the other share. Check you used the number in the ratio that belongs to the person in the question.

Watch

Stuck? **Watch a short video** that shows this skill step by step.
smartcublearning.com/go/69478

Explore

Want more practice? **Practise this skill online.**
smartcublearning.com/go/66637

SAMPLE

Part 1 Warm up: small totals and simple recipes

15 questions. Circle the letter of your answer. Use spare paper for your working.

1 A total of 25 buttons is shared between Amina and Callum in the ratio 3:2. How many buttons does Amina get?

A 5 **B** 15 **C** 10 **D** 20

2 A total of 20 shells is shared between Callum and Amina in the ratio 3:1. How many shells does Callum get?

A 20 **B** 10 **C** 15 **D** 5

3 A total of 12 beads is shared between Devi and Callum in the ratio 1:3. How many beads does Devi get?

A 6 **B** 3 **C** 12 **D** 9

4 A total of 40 beads is shared between Callum and Hugo in the ratio 2:3. How many beads does Callum get?

A 20 **B** 24 **C** 16 **D** 8

5 A total of 24 buttons is shared between Callum and Erin in the ratio 2:1. How many buttons does Callum get?

A 8 **B** 16 **C** 24 **D** 12

6 A total of 12 tokens is shared between Bella and Grace in the ratio 2:1. How many tokens does Bella get?

A 6 **B** 4 **C** 8 **D** 12

7 A total of 25 counters is shared between Hugo and Erin in the ratio 1:4. How many counters does Hugo get?

A 5 **B** 25 **C** 10 **D** 20

8 A total of 40 tokens is shared between Hugo and Amina in the ratio 1:4. How many tokens does Hugo get?

A 8 **B** 32 **C** 20 **D** 16

9 A recipe uses 3 plums for every 2 apricots. How many apricots are needed for 6 plums?

A 6 **B** 4 **C** 8 **D** 1

10 A recipe uses 3 peaches for every 2 lemons. How many lemons are needed for 15 peaches?

A 10 **B** 15 **C** 7 **D** 14

11 A recipe uses 2 apples for every 3 pears. How many pears are needed for 8 apples?

A 8 **B** 9 **C** 15 **D** 12

12 A recipe uses 5 lemons for every 2 cherries. How many cherries are needed for 30 lemons?

A 30 **B** 12 **C** 8 **D** 27

13 A fruit stall sells 7 cherries for every 2 pears. How many pears does it sell with 49 cherries?

A 44 **B** 49 **C** 9 **D** 14

14 A recipe uses 2 apricots for every 7 peaches. How many peaches are needed for 6 apricots?

A 28 **B** 6 **C** 14 **D** 21

15 A recipe uses 3 apricots for every 4 lemons. How many lemons are needed for 15 apricots?

A 15 **B** 24 **C** 9 **D** 20

Score: _____ / 15

SAMPLE

Part 3 Stretch: harder ratios

15 questions. Circle the letter of your answer. Use spare paper for your working.

31 A total of 90 marbles is shared between Farid and Devi in the ratio 2:7. How many marbles does Farid get?

A 20 **B** 45 **C** 70 **D** 10

32 A total of 117 shells is shared between Farid and Amina in the ratio 5:4. How many shells does Farid get?

A 78 **B** 13 **C** 52 **D** 65

33 A total of 242 stickers is shared between Amina and Grace in the ratio 5:6. How many stickers does Amina get?

A 121 **B** 110 **C** 132 **D** 22

34 A total of 48 marbles is shared between Bella and Hugo in the ratio 5:3. How many marbles does Bella get?

A 30 **B** 6 **C** 24 **D** 18

35 A total of 96 tokens is shared between Amina and Callum in the ratio 5:3. How many tokens does Amina get?

A 12 **B** 60 **C** 48 **D** 36

36 A total of 135 stickers is shared between Bella and Amina in the ratio 7:2. How many stickers does Bella get?

A 105 **B** 30 **C** 120 **D** 15

37 A total of 126 beads is shared between Farid and Amina in the ratio 5:4. How many beads does Farid get?

A 56 **B** 70 **C** 14 **D** 63

38 A total of 198 beads is shared between Amina and Bella in the ratio 5:6. How many beads does Amina get?

A 99 **B** 108 **C** 90 **D** 18

39 A school kitchen orders 4 apricots for every 5 lemons. How many lemons does it order with 48 apricots?

A 20 **B** 65 **C** 48 **D** 60

40 A juice factory uses 3 pears for every 7 peaches. How many peaches does it use with 36 pears?

A 91 **B** 84 **C** 43 **D** 36

41 A school kitchen orders 5 lemons for every 4 apples. How many apples does it order with 50 lemons?

A 50 **B** 14 **C** 40 **D** 49

42 A school kitchen orders 5 pears for every 3 plums. How many plums does it order with 45 pears?

A 45 **B** 27 **C** 24 **D** 30

43 A school kitchen orders 3 pears for every 7 apples. How many apples does it order with 18 pears?

A 18 **B** 49 **C** 42 **D** 35

44 A recipe uses 5 plums for every 3 oranges. How many oranges are needed for 20 plums?

A 20 **B** 15 **C** 12 **D** 7

45 A recipe uses 5 pears for every 4 oranges. How many oranges are needed for 25 pears?

A 25 **B** 24 **C** 20 **D** 9

Score: _____ / 15

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