


Progression in Mathematics at Hessle Academy

Ratio



Learning Objective: Simplify a ratio

2

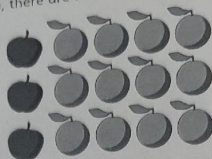


Write the ratio of apples to oranges in the form 1:n.

$1:3$

Express ratios in the form 1:n

1 For every one apple, there are four oranges.



a) Write the ratio of apples to oranges in three different ways.

$3:12$ $1:4$ $3:3$

b) Compare answers with a partner.
Can you see all of your answers in the picture?

c) Which ratio is in its simplest form? How do you know?

$1:4$ is the simplest form

d) Write the ratio 3:12 in the form 1:n.

$1:4$

Learning Objective: Share a quantity into a ratio

D) Divide £ 62.50 in the ratio 8:7 = 15

35	35	35	35	35	35	35	35
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= 28

35	35	35	35	35	35	35	35
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= 24.5

28:24.5

$62.50 \div 15 = 3.5$

E) Divide £ 121 in the ratio 9:2 = 11

11	11	11	11	11	11	11	11	11	11
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= 99

22	22
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= 22

99:22

Learning Objective:
Calculate a quantity in a ratio when one is known and calculate ingredients needed for recipes.

Example:

Jack is making scones

- 50g of sugar
- 8 scones
- 200g of flour
- 30g of sugar
- 140ml of milk

How much of each ingredients does he need for:

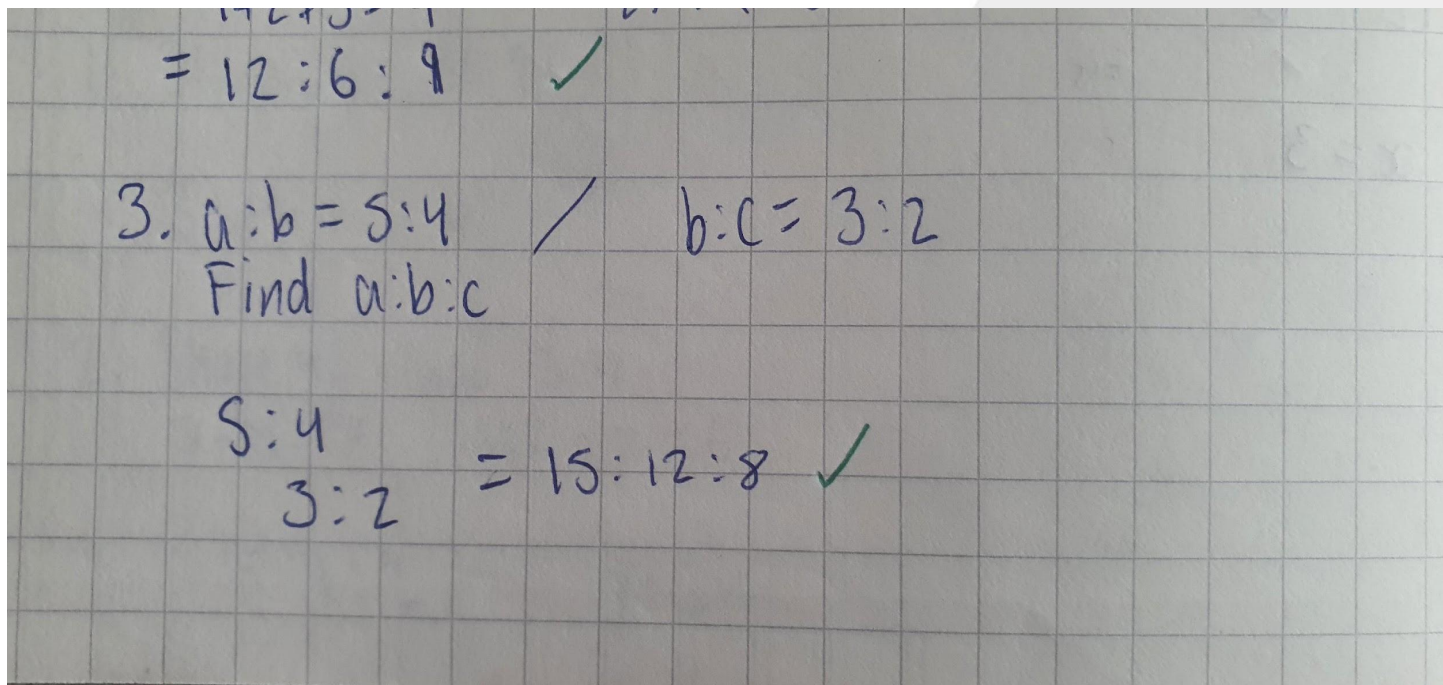
Ⓐ 24 scones

- $24 \div 8 = 3$
- $200 \times 3 = 600\text{g}$
- $30 \times 3 = 90\text{g}$
- $50 \times 3 = 150\text{g}$
- $140 \times 3 = 420\text{ml}$
- $1 \times 3 = 3\text{ eggs}$

Ⓑ 2 scones

- $8 \div 4 = 2$
- $200 \div 4 = 50\text{g}$
- $30 \div 4 = 7.5\text{g}$
- $50 \div 4 = 12.5\text{g}$
- $140 \div 4 = 35\text{ml}$
- $1 \div 4 = 0.25$

Learning Objective: Combine $a:b$ and $b:c$ into $a:b:c$



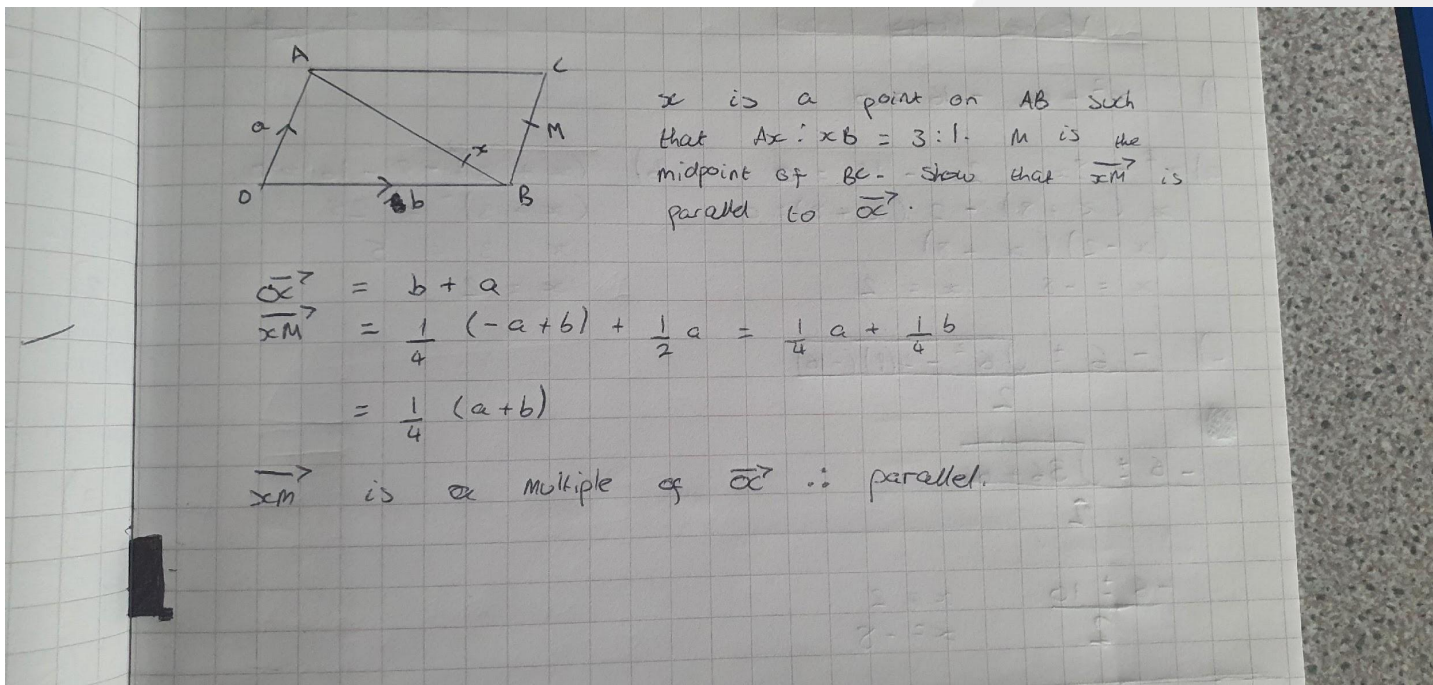
Handwritten work on grid paper:

Top line: $= 12:6:9$ ✓

3. $a:b = 5:4$ / $b:c = 3:2$
Find $a:b:c$

Below:
 $5:4$
 $3:2$ $= 15:12:8$ ✓

Learning Objective: Solve algebraic ratio problems



x is a point on AB such that $Ax : xB = 3 : 1$. M is the midpoint of BC . Show that \overrightarrow{XM} is parallel to \overrightarrow{AC} .

$$\overrightarrow{AC} = b + a$$

$$\overrightarrow{XM} = \frac{1}{4}(-a + b) + \frac{1}{2}a = \frac{1}{4}a + \frac{1}{4}b$$

$$= \frac{1}{4}(a + b)$$

\overrightarrow{XM} is a multiple of $\overrightarrow{AC} \therefore$ parallel.

