3.4 Writing and Simplifying Ratio: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write the ratio of red pens to green pens. There are 6 red pens and 10 green pens.

(Total for Question 1 is 1 mark)

2 Simplify the ratio 8:12.

(Total for Question 2 is 1 mark)

3 Write the ratio of blue tiles to yellow tiles in simplest form. There are 9 blue tiles and 6 yellow tiles.

(Total for Question 3 is 1 mark)

4 There are 18 apples to be shared in the ratio 2:1. Work out how many apples the larger share receives.

(Total for Question 4 is 2 marks)

5 Write the ratio 15:27 in its simplest form.

(Total for Question 5 is 1 mark)

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6 Write the ratio 48:32:56 in its simplest form.

(Total for Question 6 is 2 marks)

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7 Write the ratio 8:32:24 in its simplest form.

(Total for Question 7 is 2 marks)

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8 Write the ratio 175 cm to 12.75 m in its simplest form.

(Total for Question 8 is 3 marks)

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9 In a choir there are 21 girls and 11 boys.
Write the ratio of girls to all the members in its simplest form.

(Total for Question 9 is 2 marks)

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10 Write the ratio 10:68 in the form 1:n.

(Total for Question 10 is 2 marks)

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11 Write the ratio 30:5:40 in its simplest form.

(Total for Question 11 is 2 marks)

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12 Write the ratio 550 m to 12.25 km in its simplest form.

(Total for Question 12 is 3 marks)

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13 Given that a : b = 5 : 2 and a = 25, work out the value of b.

(Total for Question 13 is 2 marks)

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14 Write the ratio 84:126 in its simplest form.

(Total for Question 14 is 2 marks)

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15 A section of a map is drawn so that 1 cm on the map represents 250 m in real life. Two towns are 9 km apart in real life. Express this distance on the map in centimetres and give the answer in the ratio map:real.

(Total for Question 15 is 4 marks)

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16 Show that the ratio $(3x + 6) : (x + 2)$ simplifies to 3:1 for all values of x for which the expressions are defined. Explain your steps.

(Total for Question 16 is 5 marks)

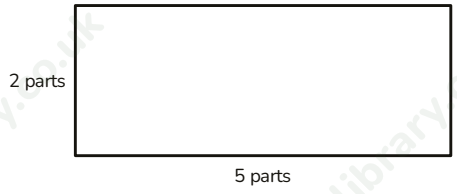
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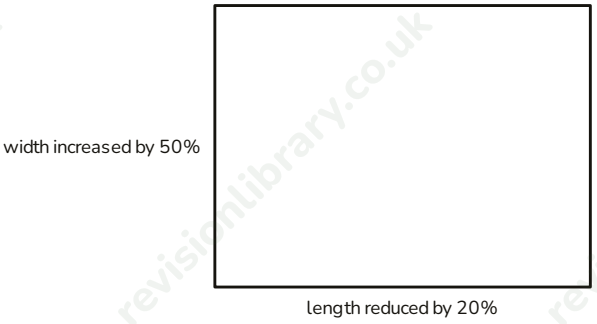
17 A wine merchant mixes red and white wine in the ratio 7:3 by volume. He needs to prepare 50 litres of the mixture but realises the supplier only has 30 litres of red wine available. He will use all 30 litres of red and make up the remainder with white wine.
Calculate the ratio of red to white in the final 50 litre mixture, in simplest form.

(Total for Question 17 is 4 marks)

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18 A rectangle has its length and width in the ratio 5:2. A student claims that if the width is increased by 50% and the length is reduced by 20%, the area of the rectangle remains unchanged.
Determine whether the student is correct by calculating the new ratio of length to width after the changes and comparing the areas. Give your working and conclusion.





(Total for Question 18 is 4 marks)

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Mark scheme · 3.4 Writing and Simplifying Ratio: Test Pack

Question 1

3:5 cao **B1**

Answer: 3:5

Question 2

2:3 cao **B1**

Answer: 2:3

Question 3

3:2 cao **B1**

Answer: 3:2

Question 4

find one part: 18/3 = 6 or equivalent **M1**

12 apples cao **A1**

Answer: 12

Question 5

5:9 **B1**

Answer: 5:9

Question 6

divides all three terms by a common factor (8) **M1**

6:4:7 **A1**

Answer: 6:4:7

Question 7

divides all three terms by a common factor (8) **M1**

1:4:3 **A1**

Answer: 1:4:3

Question 8

converts to the same units **M1**

175:1275 **M1**

7:51 cao **A1**

Answer: 7:51

Question 9

21:32 identified **M1**

21:32 cao **A1**

Answer: 21:32

Question 10

divides by 10 **M1**

1:6.8 cao **A1**

Answer: 1:6.8

Question 11

divides all three terms by a common factor (5) **M1**

6:1:8 **A1**

Answer: 6:1:8

Question 12

converts to the same units **M1**

550:12250 **M1**

11:245 cao **A1**

Answer: 11:245

Question 13

find one part: 25/5 = 5 or equivalent method **M1**

10 cao **A1**

Answer: 10

Question 14

divide both numbers by a common factor, e.g. show division by 42 or sequential common-factor division **M1**

2:3 cao **A1**

Answer: 2:3

Question 15

convert 9 km to metres: 9 km = 9000 m and divide by 250 to find map distance **M1**

calculate map distance = 9000 / 250 = 36 cm **M1**

36 cm cao **A1**

convert real distance to centimetres: 9000 m = 900000 cm; ratio map:real = 36:900000 simplified to 1:25000 cao **A1**

Answer: 36 cm; ratio 1:25000

Question 16

factorise numerator: 3x + 6 = 3(x + 2) **M1**

rewrite ratio as 3(x + 2) : (x + 2) **M1**

cancel common factor (x + 2), showing cancellation step **M1**

state domain restriction $x \neq -2$ so cancellation is valid for defined values **B1**

3:1 cao **A1**

Answer: 3:1

Question 17

find white used = 50 - 30 = 20 litres **M1**

write the raw ratio 30:20 **M1**

simplify the ratio by dividing by common factor 10 **M1**

3:2 cao **A1**

Answer: 3:2

Question 18

let length = 5k and width = 2k, then calculate new length and width: new length = 5k * 0.8 = 4k, new width = 2k * 1.5 = 3k **M1**

state new ratio length:width = 4k:3k and simplify if required **M1**

calculate original area = 5k * 2k = $10k^2$ and new area = 4k * 3k = $12k^2$ **M1**

conclude with a clear statement comparing areas and giving conclusion (areas are not equal so the student's claim is incorrect) cao **A1**

Answer: New length = 4k, new width = 3k so new ratio length:width = 4:3. Original area = $10k^2$, new area = $12k^2$. Since $10k^2$ is not equal to $12k^2$ the areas are not the same, so the student's claim is incorrect.

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