5.1 Writing a Ratio as a Fraction or Linear Function: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 In a bag of counters, the ratio of red counters to blue counters is 3:5.

(a) Write the number of red counters as a fraction of the number of blue counters. **(1)**

(b) Write the number of red counters as a fraction of the total number of counters in the bag. **(1)**

(Total for Question 1 is 2 marks)

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2 Write the relationship between x and y as a linear function y = kx when y is directly proportional to x with ratio 4:1 (y:x = 4:1). State the value of k.

(Total for Question 2 is 3 marks)

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3 The ratio of the length of Path A to the length of Path B is 15:40.

(a) Simplify the ratio 15:40 fully. **(1)**

(b) Using your simplified ratio, write the length of Path A as a fraction of the length of Path B. **(1)**

(Total for Question 3 is 2 marks)

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4 A ratio is 8:9. Write down the second quantity as a fraction of the first quantity, giving your fraction in its simplest form.

(Total for Question 4 is 1 mark)

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5 A map scale shows that 1 cm represents 3 km. Express the distance d in kilometres as a linear function of the map length m in centimetres in the form d = km. Give k.

(Total for Question 5 is 5 marks)

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6 Oliwia buys pens and pencils in the ratio 4:3. She spends £21 in total. How much does one part represent, and how much did she spend on pens? Write your answer as a fraction of the total spent and as a decimal for the amount on pens.

(Total for Question 6 is 4 marks)

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7 The lengths of three pieces of ribbon are in the ratio 7:4:9. The longest piece is 63 cm. Work out the length of the shortest piece.

(Total for Question 7 is 3 marks)

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8 A gardener uses compost and soil in the ratio 2:5. If the gardener uses x kg of compost, show that the total mixture M in kg can be written as M = 7/2 x, then simplify this expression to a single decimal.

(Total for Question 8 is 6 marks)

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Mark scheme · 5.1 Writing a Ratio as a Fraction or Linear Function: 30-minute Pack

Question 1

(a) 3/5 oe **B1**

(a) Answer: 3/5

(b) 3/8 oe **B1**

(b) Answer: 3/8

Question 2

recognises y/x = 4/1 so k = 4 or writes y = 4x **M1**

y = 4x cao **A1**

k = 4 stated explicitly **B1**

Answer: y = 4x, k = 4

Question 3

(a) 3:8 cao **B1**

(a) Answer: 3:8

(b) 3/8 ft from (a) **B1**

(b) Answer: 3/8

Question 4

9/8 cao **B1**

Answer: 9/8

Question 5

identifies ratio d:m = 3:1 or d = 3 m **M1**

writes d = 3m with units **M1**

d = 3m cao **A1**

states k = 3 **B1**

units consistent: d in km when m in cm or equivalent **B1**

Answer: d = 3m, k = 3

Question 6

uses total parts 4 + 3 = 7 and finds one part = 21/7 = 3 **M1**

one part = £3 cao **A1**

calculates pens cost = 4 parts = 4 * 3 = 12 **M1**

pens cost £12 and fraction 12/21 = 4/7 cao, decimal 12.00 or 12.0 **A1**

Answer: One part = £3; spent on pens = £12, which is 12/21 = 4/7 of the total, amount £12.00

Question 7

use scale factor: 63 corresponds to 9 (the largest part) so factor = 63/9 = 7 **M1**

identify shortest part is 4 (smallest of 7, 4, 9) and multiply by factor: 4 * 7 **M1**

28 cm cao **A1**

Answer:28 cm.

Working check: scale factor = 63/9 = 7, shortest part is 4, shortest = 4 * 7 = 28.

Question 8

uses ratio compost:soil = 2:5 so total parts = 7 and one part = x/2 (since compost is 2 parts = x) **M1**

writes total mixture as M = 7 * (x/2) or equivalent **M1**

shows M = 7/2 x cao **A1**

correct explanation that total parts = 7 so total = 7 times one part, and one part = x/2, so M = 7 * x/2 oe **B1**

converts 7/2 to a decimal: 7/2 = 3.5 **M1**

simplifies to M = 3.5x cao **A1**

Answer: M = 7/2 x = 3.5x

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