3.5 Ratio: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Three friends share 312 stickers in the ratio 7:5:1.
Work out the largest share.

(Total for Question 1 is 3 marks)

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2 Ivan and Jade share £555 in the ratio 8:7.
Work out how much each person receives.

(Total for Question 2 is 3 marks)

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3 A class has boys and girls in the ratio 5:7. If there are 35 boys, how many pupils are there in total?

(Total for Question 3 is 3 marks)

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4 Mix paint in the ratio red:blue = 2:5. How much red paint is needed for 35 litres of the mix?

(Total for Question 4 is 3 marks)

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5 Amira and Ben share £96 in the ratio 5 : 3. Work out how much each person receives.

(Total for Question 5 is 3 marks)

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6 The exchange rate is £1 : 1.28 dollars. Nadia changes £250 into dollars before a trip to New York. Work out how many dollars she receives.

(Total for Question 6 is 2 marks)

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7 A bowl contains fruit in the ratio apples:pears:bananas = 4:2:3. There are 36 pieces of fruit in the bowl. How many apples are there?

(Total for Question 7 is 4 marks)

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8 Ali and Zahra share money in the ratio 7:3. After Zahra receives £120, Ali has £280. Work out how much money they shared in total.

(Total for Question 8 is 4 marks)

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9 The cost of ribbon is directly proportional to its length. 3 metres of ribbon costs £5.40. Work out the cost of 8 metres of the same ribbon.

(Total for Question 9 is 3 marks)

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10 An alloy is made from copper and tin in the ratio 7 : 3 by mass. A sample of the alloy has a mass of 450 g. Work out the mass of copper in the sample.

(Total for Question 10 is 3 marks)

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11 On a school minibus, the ratio of adults to children is 2 : 5. There are 15 children on the minibus. Work out the total number of people on the minibus.

(Total for Question 11 is 3 marks)

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12 A carton contains orange and black sweets in the ratio 9:7. After 16 orange sweets are eaten, the ratio of orange to black becomes 5:4. How many black sweets were in the carton at the start?

(Total for Question 12 is 4 marks)

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13 Three friends share the prize money in the ratio 4 : 3 : k. The first two receive a total of £140 and the third receives £40 more than the second.
Find k and the total prize money.

(Total for Question 13 is 4 marks)

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14 In triangle ABC, point D is on AC such that AD : DC = 2 : 3.
Show that BD divides the triangle into two regions (triangles ABD and DBC) whose areas are in the ratio 2 : 3. (You may assume triangles with equal heights have areas proportional to their bases.)

(Total for Question 14 is 5 marks)

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Mark scheme · 3.5 Ratio: 1-hour Pack

Question 1

13 parts in total and 312/13 = 24	**M1**
largest part 7 x 24	**M1**
168	**A1**

Answer: 168

Question 2

8 + 7 = 15 parts	**M1**
555 / 15 = 37 per part	**M1**
£296 and £259	**A1**

Answer: Ivan £296 and Jade £259

Question 3

Find one share: 35 corresponds to 5 so one share = 35/5 = 7 (method)	**M1**
Total shares = 5+7 =12 so total pupils = 12 x 7 = 84 (method)	**M1**
84 pupils cao	**A1**

Answer: 84 pupils

Question 4

One share: 35 divided by (2+5)=35/7=5 (method)	**M1**
Red amount = 2 x 5 = 10 litres (method)	**M1**
10 litres cao	**A1**

Answer: 10 litres

Question 5

total parts = 5 + 3 = 8	**M1**
96 / 8 = 12 (value of one part)	**M1**
Amira = £60 and Ben = £36 (cao)	**A1**

Answer: Amira = £60, Ben = £36

Question 6

250 x 1.28 (oe)	**M1**
320 dollars (cao)	**A1**

Answer: 320 dollars

Question 7

Find one share: 36 divided by (4+2+3)=36/9=4 (method)	**M1**
Apples = 4 x 4 = 16 (method)	**M1**
16 cao	**A1**
final answer with correct unit or context	**B1**

Answer: 16 apples

Question 8

Use the ratio to find one share: Zahra has 3 shares = 120 so one share = 120/3 = 40 (method)	**M1**
Ali has 7 shares so Ali = 7 x 40 = 280 (method shown matching given)	**M1**
Total shares = 7+3 = 10 so total = 10 x 40 = 400	**M1**
£400 cao	**A1**

Answer: £400

Question 9

5.40 / 3 = 1.80 (cost per metre)	**M1**
1.80 x 8 (oe)	**M1**
£14.40 (cao)	**A1**

Answer: £14.40

Question 10

total parts = 7 + 3 = 10	**M1**
450 / 10 = 45 (value of one part)	**M1**
315 g (cao)	**A1**

Answer: 315 g

Question 11

15 / 5 = 3 (value of one part)	**M1**
adults = 2 x 3 = 6	**M1**
21 (cao)	**A1**

Answer: 21 people

Question 12

Let k be the common factor: initially orange = 9k, black = 7k. After eating 16 orange, (9k - 16) : 7k = 5 : 4. Set up equation	**M1**
Cross-multiply: 4(9k - 16) = 5(7k) -> 36k - 64 = 35k (method)	**M1**
Solve for k: 36k - 35k = 64 -> k = 64 (method)	**M1**
Black sweets initially = 7k = 7 x 64 = 448 cao	**A1**

Answer: 448 black sweets

Question 13

let the amounts be 4x, 3x and kx; use kx = 3x + 40	**M1**
from kx = 3x + 40 get (k - 3)x = 40; also 4x + 3x = 140 so 7x = 140 hence x = 20	**M1**
k - 3 = 40/x = 40/20 = 2 so k = 5	**A1**
total = (4+3+5)x = 12 * 20 = £240 cao	**A1**

Answer: k = 5, total prize money = £240

Question 14

recognise that triangles ABD and DBC share vertex B and have bases AD, DC on the same straight line AC, so they share the same perpendicular height from B to AC	**M1**
state that triangles with equal heights have areas proportional to their base lengths	**M1**
area(ABD) : area(DBC) = AD : DC = 2 : 3	**A1**
verify with a worked example, e.g. coordinates A=(0,0), C=(5,0), B=(0,3), D=(2,0): area ABD = 3, area DBC = 4.5, ratio 3:4.5 = 2:3	**M1**
conclude BD divides the triangle into two regions with areas in ratio 2 : 3 cao	**A1**

Answer: 2 : 3

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