3.4 Ratio Problems with Totals and Differences: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The ratio of red to blue counters in a bag is 4 : 7. There are 28 blue. How many red are there?

(3)

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2 Zain's fruit squash is made with juice and water in the ratio 4 : 3. Elena's squash is made with juice and water in the ratio 5 : 6. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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3 Priya and Tom share £108 in the ratio 1 : 2. How much does each person get?

(3)

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4 Elena's fruit squash is made with juice and water in the ratio 1 : 2. Hamza's squash is made with juice and water in the ratio 1 : 5. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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5 Maya and Noah share 222 sweets in the ratio 5 : 1. How much does each person get?

(3)

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6 The ratio of boys to girls in a club is 4 : 5. There are 35 girls. How many boys are there?

(3)

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7 The ratio of adults to children at a concert is 7 : 4. There are 33 more adults than children. How many adults and children are there altogether?

(4)

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8 Ravi's fruit squash is made with juice and water in the ratio 2 : 3. Uma's squash is made with juice and water in the ratio 2 : 4. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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9 The ratio of adults to children at a concert is 1 : 7. There are 70 children. How many adults are there?

(3)

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10 Red and white are mixed in the ratio 1 : 2 to make paint. How many litres of white are needed to mix with 3 litres of red?

(2)

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11 Ravi's fruit squash is made with juice and water in the ratio 3 : 8. Isla's squash is made with juice and water in the ratio 6 : 6. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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12 The ratio of red to blue counters in a bag is 7 : 8. There are 24 blue. How many red are there?

(3)

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13 The ratio of red to blue counters in a bag is 1 : 9. There are 40 red and blue altogether. How many more blue than red are there?

(3)

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14 Maya and Priya share £104 in the ratio 1 : 3. How much does each person get?

(3)

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15 Isla's fruit squash is made with juice and water in the ratio 3 : 2. Orla's squash is made with juice and water in the ratio 3 : 4. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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16 Red and blue paint are mixed in the ratio 8 : 1. What fraction of the mixture is red?

(2)

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17 Maya, Noah and Tom share 174 sweets in the ratio 1 : 3 : 2. How much does each person get?

(3)

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18 Isla, Hamza and Noah share £264 in the ratio 6 : 1 : 1. How much does each person get?

(3)

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19 Aisha's fruit squash is made with juice and water in the ratio 5 : 3. Quinn's squash is made with juice and water in the ratio 1 : 6. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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20 A map scale shows 1 cm represents 6 km. On the map two towns are placed so the map distance between them is divided in the ratio 2 : 3 and the total map distance is 15 cm. What is the actual distance in km between the two towns?

Calculate the actual distance in kilometres. **(2)**

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21 Femi's fruit squash is made with juice and water in the ratio 3 : 3. Uma's squash is made with juice and water in the ratio 3 : 4. Whose squash is stronger (has the greater fraction of juice)? Show your working.

(3)

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22 A and B share a prize in the ratio 3 : 5. The difference between their amounts is £40. Work out A's share and B's share.

Find A's share and B's share in pounds. **(3)**

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23 A school has a ratio of teachers to teaching assistants of 7 : 2. If there are 81 staff members in total, how many teachers and how many teaching assistants are there?

Find the number of teachers and the number of teaching assistants. **(3)**

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24 At an animal shelter, the ratio of cats to dogs is 3 : 4. There are 35 animals in total. How many dogs are there?

(2)

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25 A ribbon of length 96 cm is cut in the ratio 5 : 3. Find the length of the longer piece.

(2)

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26 Two numbers are in the ratio 7 : 9. Their sum is 96. Find the smaller number.

(2)

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27 A mixture requires flour and sugar in the ratio 8 : 3. The total mixture uses 220 g. Find the mass of sugar.

(2)

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28 Sam and Leo share a sum of money in the ratio 4 : 7. The difference between their shares is £45. Work out the total sum of money shared.

(3)

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29 A fruit basket contains apples and oranges in the ratio 5 : 8. There are 27 more oranges than apples. How many pieces of fruit are there in total?

(3)

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30 A charity raises money from two collections in the ratio 3 : 5. The total raised was £960. Work out how much more the second collection raised than the first.

(3)

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31 The ratio of red counters to blue counters in a bag is 6 : 11. There are 40 more blue counters than red counters. Work out the total number of counters in the bag.

(3)

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32 On a school trip, adults and students are in the ratio 2 : 9. The number of students exceeds the number of adults by 63. Work out the total number of people on the trip.

(3)

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33 Stretch question. Two jars contain marbles in the ratio 5 : 6 (Jar A to Jar B). Jar B contains 21 more marbles than Jar A. Then 3 marbles are moved from Jar B to Jar A. Work out the new ratio of marbles in Jar A to Jar B, giving your answer in its simplest form.

(3)

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34 A ratio is 4 : 10. Simplify it.

(1)

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Mark scheme · 3.4 Ratio Problems with Totals and Differences: 2-hour Pack

Question 1

28 ÷ 7 = 4	M1
4 x 4	M1
16 cao	A1

Answer: **16**

Question 2

4/7 or a decimal for one squash	M1
5/11 for the other, compared	M1
Zain's squash is stronger	A1

Answer: **Zain's squash is stronger**

Question 3

1 + 2 = 3 parts	M1
108 ÷ 3 = 36	M1
Priya £36, Tom £72 cao	A1

Answer: **Priya £36, Tom £72**

Question 4

1/3 or a decimal for one squash	M1
1/6 for the other, compared	M1
Elena's squash is stronger	A1

Answer: **Elena's squash is stronger**

Question 5

5 + 1 = 6 parts	M1
222 ÷ 6 = 37	M1
Maya 185, Noah 37 cao	A1

Answer: **Maya 185, Noah 37**

Question 6

35 ÷ 5 = 7	M1
7 x 4	M1
28 cao	A1

Answer: **28**

Question 7

difference in parts 3	M1
33 ÷ 3 = 11	M1
11 x 11	M1
121 cao	A1

Answer: **121**

Question 8

2/5 or a decimal for one squash	M1
2/6 for the other, compared	M1
Ravi's squash is stronger	A1

Answer: **Ravi's squash is stronger**

Question 9

70 ÷ 7 = 10	M1
10 x 1	M1
10 cao	A1

Answer: **10**

Question 10

3 ÷ 1 = 3	M1
6 litres cao	A1

Answer: **6 litres**

Question 11

3/11 or a decimal for one squash	M1
6/12 for the other, compared	M1
Isla's squash is stronger	A1

Answer: **Isla's squash is stronger**

Question 12

24 ÷ 8 = 3	M1
3 x 7	M1
21 cao	A1

Answer: **21**

Question 13

40 ÷ 10 = 4	M1
8 x 4	M1
32 cao	A1

Answer: **32**

Question 14

1 + 3 = 4 parts	M1
104 ÷ 4 = 26	M1
Maya £26, Priya £78 cao	A1

Answer: **Maya £26, Priya £78**

Question 15

3/5 or a decimal for one squash	M1
3/7 for the other, compared	M1
Isla's squash is stronger	A1

Answer: **Isla's squash is stronger**

Question 16

8 + 1 = 9 parts	M1
8/9 cao	A1

Answer: **8/9**

Question 17

1 + 3 + 2 = 6 parts	M1
174 ÷ 6 = 29	M1
Maya 29, Noah 87, Tom 58 cao	A1

Answer: **Maya 29, Noah 87, Tom 58**

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Question 18

6 + 1 + 1 = 8 parts	**M1**
264 ÷ 8 = 33	**M1**
Isla £198, Hamza £33, Noah £33 cao	**A1**

Answer: **Isla £198, Hamza £33, Noah £33**

Question 19

5/8 or a decimal for one squash	**M1**
1/7 for the other, compared	**M1**
Aisha's squash is stronger	**A1**

Answer: **Aisha's squash is stronger**

Question 20

method: total map length 15 cm corresponds to 15 x 6 km	**M1**
90 km cao	**A1**

Answer: **90 km**

Question 21

3/6 or a decimal for one squash	**M1**
3/7 for the other, compared	**M1**
Femi's squash is stronger	**A1**

Answer: **Femi's squash is stronger**

Question 22

method: difference in parts = 5 - 3 = 2 so one part = 40 / 2 = 20	**M1**
method: compute each share: A = 3 x 20, B = 5 x 20	**M1**
A = 60, B = 100 cao	**A1**

Answer: **A = 60, B = 100**

Question 23

method: one part = 81 / (7+2) = 81/9 = 9	**M1**
method: compute each group: teachers = 7 x 9, assistants = 2 x 9	**M1**
63 teachers and 18 teaching assistants cao	**A1**

Answer: **63 teachers and 18 teaching assistants**

Question 24

one part = 35 / (3+4) = 5	**M1**
20 cao	**A1**

Answer: **20**

Question 25

one part = 96 / (5+3) = 12	**M1**
60 cm cao	**A1**

Answer: **60 cm**

Question 26

one part = 96 / (7+9) = 6	**M1**
42 cao	**A1**

Answer: **42**

Question 27

one part = 220 / (8+3) = 20	**M1**
60 g cao	**A1**

Answer: **60 g**

Question 28

difference in parts = 7 - 4 = 3, so one part = 45 / 3 = 15	**M1**
compute total parts = 4 + 7 = 11 and multiply by 15	**M1**
£165 cao	**A1**

Answer: **£165**

Question 29

difference in parts = 8 - 5 = 3, so one part = 27 / 3 = 9	**M1**
compute total parts = 5 + 8 = 13 and multiply by 9	**M1**
117 cao	**A1**

Answer: **117**

Question 30

one part = 960 / (3+5) = 120	**M1**
find each collection: 3x120=360, 5x120=600	**M1**
£240 cao	**A1**

Answer: **£240**

Question 31

difference in parts = 11 - 6 = 5, so one part = 40 / 5 = 8	**M1**
compute total parts = 6 + 11 = 17 and multiply by 8	**M1**
136 cao	**A1**

Answer: **136**

Question 32

difference in parts = 9 - 2 = 7, so one part = 63 / 7 = 9	**M1**
compute total parts = 2 + 9 = 11 and multiply by 9	**M1**
99 cao	**A1**

Answer: **99**

Question 33

difference in parts = 6 - 5 = 1, so one part = 21 / 1 = 21	**M1**
find amounts before transfer (A=105, B=126) and adjust: A=108, B=123	**M1**
36 : 41 cao	**A1**

Answer: **36 : 41**

Question 34

2 : 5 cao	**B1**

Answer: **2 : 5**

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