3.4 Ratio Problems with Totals and Differences: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write the following ratios in their simplest form.

(a) Simplify the ratio 12 : 20 **(1)**

(b) Simplify the ratio 18 : 27 **(1)**

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2 A mixture contains sugar and water in the ratio 2 : 9. After adding 3 kg of sugar, the ratio becomes 5 : 9. How much sugar was in the mixture to start with?

Find the initial mass of sugar in kilograms. **(4)**

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3 A class mixes red and blue paint in the ratio 4 : 7 to make purple. They need 33 litres of purple paint. How many litres of blue paint must they use? If they decide instead to add 2 litres more red paint but keep the blue the same, what will the new ratio of red to blue be?

(a) How many litres of blue paint are used? **(3)**

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(b) If 2 litres more red are added but blue remains the same, what is the new ratio of red to blue? Give the ratio in its simplest whole-number form. **(3)**

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4 Stretch question. A, B and C share an inheritance in the ratio 4 : 6 : 9. C then gives 70 to A and 10 to B. Now the three have equal amounts. Work out the original total inheritance.

Find the original total inheritance in pounds. **(5)**

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

(3)

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6 The ratio of adults to children at a concert is 5 : 6. There are 66 children. How many adults are there?

(3)

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7 Sofia and Wendy share £63 in the ratio 1 : 2. How much does each person get?

(3)

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8 1/8 of the sweets in a jar are red and the rest are green. Write the ratio of red sweets to green sweets in its simplest form.

(2)

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9 Tom and Aisha share £84 in the ratio 5 : 7. How much more does Aisha get than Tom?

Find the difference between Aisha's share and Tom's share. **(3)**

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10 Orange juice and lemonade are mixed in the ratio 3 : 7 to make punch. How many ml of lemonade are needed to mix with 600 ml of orange juice?

(2)

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11 Orange juice and lemonade are mixed in the ratio 4 : 7 to make punch. Sam has 1400 ml of orange juice and 2471 ml of lemonade. What is the greatest amount of punch he can make?

(4)

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12 The three angles of a triangle are in the ratio 2 : 3 : 4. Find the smallest angle.

(2)

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13 Write the ratio 9 : 6 in its simplest form.

(1)

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14 Share 40 sweets in the ratio 3 : 5. Find each share.

(2)

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15 A box of pens has blue pens and black pens in the ratio 5 : 3. There are 24 pens in total. How many black pens are there?

(2)

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Mark scheme · 3.4 Ratio Problems with Totals and Differences: Test Pack

Question 1

(a) 3 : 5 cao	B1
(a) Answer: **3 : 5**	
(b) 2 : 3 cao	B1
(b) Answer: **2 : 3**	

Question 2

method: let one part = x, initial sugar = 2x, water = 9x	M1
method: after adding 3 kg sugar new sugar = 2x + 3 and ratio (2x+3) : 9x = 5 : 9 leading to equation 9(2x+3) = 5(9x)	M1
method: solve equation 18x + 27 = 45x to get x	M1
initial sugar = 2 kg cao	A1
Answer: **2**	

Question 3

(a) method: one part = 33 / (4+7) = 33/11 = 3	M1
(a) method: blue = 7 x 3	M1
(a) 21 litres cao	A1
(a) Answer: **21**	
(b) method: initial red = 4 x 3 = 12, after adding 2 litres red = 14	M1
(b) method: new ratio 14 : 21 then simplify by dividing by GCF 7	M1
(b) 2 : 3 cao	A1
(b) Answer: **2 : 3**	

Question 4

method: let one part = x so shares are 4x, 6x, 9x	M1
method: after transfers A = 4x + 70, B = 6x + 10, C = 9x - 70 - 10 = 9x - 80	M1
method: set equal amounts A = B leading to an equation in x	M1
method: from A = B: 4x + 70 = 6x + 10 gives 60 = 2x so x = 30	M1
original total = (4+6+9)x = 19 x 30 = £570 cao	A1
Answer: **570**	

Question 5

5/8 or a decimal for one squash	M1
6/11 for the other, compared	M1
Victor's squash is stronger	A1
Answer: **Victor's squash is stronger**	

Question 6

66 ÷ 6 = 11	M1
11 x 5	M1
55 cao	A1
Answer: **55**	

Question 7

1 + 2 = 3 parts	M1
63 ÷ 3 = 21	M1
Sofia £21, Wendy £42 cao	A1
Answer: **Sofia £21, Wendy £42**	

Question 8

green = 1 - 1/8 = 7/8	M1
1 : 7 cao	A1
Answer: **1 : 7**	

Question 9

method: one part = 84 / (5+7) = 84/12 = 7	M1
method: compute each share: Tom = 5 x 7, Aisha = 7 x 7	M1
14 cao	A1
Answer: **14**	

Question 10

600 ÷ 3 = 200	M1
1400 ml cao	A1
Answer: **1400 ml**	

Question 11

orange juice supports 1400 ÷ 4 = 350 units	M1
lemonade supports 2471 ÷ 7 = 353 units	M1
uses the smaller: 350 units x 11	M1
3850 ml cao	A1
Answer: **3850 ml**	

Question 12

one part = 180 / (2+3+4) = 20	M1
40 degrees cao	A1
Answer: **40 degrees**	

Question 13

3 : 2 cao	B1
Answer: **3 : 2**	

Question 14

one part = 40 / (3+5) = 5	M1
15 and 25 cao	A1
Answer: **15 and 25**	

Question 15

one part = 24 / (5+3) = 3	M1
9 cao	A1
Answer: **9**	

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