



KS2.M-Y4R1 Reasoning and Problem Solving

Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Liam has 245 stickers. He gives 38 stickers to Mia and 17 stickers to Noah. How many stickers does Liam have left?

(2)

- 2** A packet of 6 apples costs 78p. What is the cost of one apple in pence? Give your answer in pence.

(2)

- 3** Sofia reads 36 pages each day. How many days will it take her to read a book of 252 pages?

(2)

- 4** A rectangle has length 14 cm and width 6 cm. Sara draws the same rectangle 3 times to make a strip. What is the total area of the strip in square centimetres?

(2)

5 A baker uses 450 g of flour for 15 buns. How many grams of flour does he use for one bun?

(2)

6 Tom has three boxes. The first box has 24 marbles, the second has twice as many as the first, and the third has 6 fewer than the second. How many marbles are there altogether?

(2)

7 A shelf is 180 cm long. Emma places 5 identical books along the shelf with equal spaces between them and 10 cm at each end. What is the distance between each book (the equal space between books)?

(2)

8 There are 48 children in a class. They are split into groups of 6 for an activity. After making the groups, 2 children join from another class. How many groups of 6 can be made now?

(2)

9 A toy costs £4.75. Mary has £15. How many toys can she buy and how much change will she have left? Give the change in pounds and pence.

(2)

- 10** A gardener plants bulbs in rows. Each row holds 9 bulbs. He plants 6 full rows and has 5 bulbs left. How many bulbs did he start with?

(2)

-
- 11** A bottle holds 1.5 litres of juice. How many millilitres is this? Then, if a glass holds 250 ml, how many full glasses can be filled from one bottle?

(a) Convert 1.5 litres to millilitres.

(1)

(b) How many full 250 ml glasses can be filled from the bottle?

(1)

-
- 12** A cinema has 8 rows with 12 seats in each row. Tickets for a showing sell for £6 each. If all seats are sold, what is the total money taken?

(2)

-
- 13** Nia ran 2.4 km on Monday and 3.6 km on Tuesday. How many metres did she run in total over the two days?

(2)

-
- 14** A school orders packs of pencils. Each pack has 10 pencils and costs 85p. They order 14 packs. What is the total cost in pounds and pence?

(2)

15 A class has 30 pupils. Two fifths of the class go on a trip. How many pupils go on the trip?

(2)

16 A farmer sorts 360 apples into boxes. He puts 9 apples in each small box and 30 apples in each crate. He uses only full boxes and crates and wants to use exactly 360 apples. Suggest one possible number of crates and small boxes he could use. Show how you know your answer is correct.

(3)

17 Explain why the number 48 can be made by adding three consecutive even numbers. Give an example and show the calculation.

(3)

18 A puzzle: Three friends share a bundle of carrots. Ali takes twice as many as Ben. Cara takes 5 fewer than Ali. Together they take 83 carrots. Explain whether this is possible and show why or why not.

(4)

Mark scheme · KS2.M-Y4R1 Reasoning and Problem Solving

Question 1

- **M1** Subtract 38 and 17 from 245 (correct subtraction seen)
- **B1** 190 cao
- **Answer: 190**

Question 2

- **M1** Division $78 \div 6$ or equivalent grouping seen
- **B1** 13 cao
- **Answer: 13**

Question 3

- **M1** Division $252 \div 36$ or grouping shown
- **B1** 7 cao
- **Answer: 7**

Question 4

- **M1** Area of one rectangle found: $14 \times 6 = 84$
- **B1** 252 cao
- **Answer: 252**

Question 5

- **M1** Division $450 \div 15$ or grouping shown
- **B1** 30 cao
- **Answer: 30**

Question 6

- **M1** Find second box ($24 \times 2 = 48$) and third box ($48 - 6 = 42$) or equivalent working
- **B1** 114 cao
- **Answer: 114**

Question 7

- **M1** Subtract end spaces ($180 - 20 = 160$) and divide by 4 gaps seen
- **B1** 40 cm cao
- **Answer: 40 cm**

Question 8

- **M1** Add 2 to 48 to get 50 then divide by 6 seen
- **B1** 8 remainder 2 or 8 full groups, but question asks how many groups of 6 can be made now: 8 cao
- **Answer: 8**

Question 9

- **M1** Division or repeated subtraction to find 3 toys ($3 \times 4.75 = 14.25$) seen
- **B1** 3 toys and 75p change (14.25 subtracted from 15 gives 0.75) cao
- **Answer: 3 toys, £0.75**

Question 10

- **M1** Multiply $6 \times 9 = 54$ and add 5 seen
- **B1** 59 cao
- **Answer: 59**

Question 11

- (a) **B1** 1500 ml cao
- (a) Answer: **1500**
- (b) **B1** 6 cao
- (b) Answer: **6**

Question 12

- **M1** Find total seats: $8 \times 12 = 96$ and multiply by 6 seen
- **B1** £576 cao
- Answer: **£576**

Question 13

- **M1** Convert to metres or add decimals then convert: $2.4 + 3.6 = 6.0$ km
- **B1** 6000 m cao
- Answer: **6000**

Question 14

- **M1** Multiply 85p $\times$ 14 seen ($85 \times 14 = 1190$)
- **B1** £11.90 cao
- Answer: **£11.90**

Question 15

- **M1** Find $1/5 = 30 \div 5 = 6$ or use fraction of 30: $(2/5) \times 30$ seen
- **B1** 12 cao
- Answer: **12**

Question 16

- **M1** Show a correct combination that sums to 360 using 9s and 30s (for example 6 crates $\times$ 30 = 180 and 20 small boxes $\times$ 9 = 180, or any other correct split)
- **B1** State a valid combination clearly (e.g. 6 crates and 20 small boxes)
- **B1** Calculation check shown to prove total 360 cao
- Answer: **One possibility: 6 crates and 20 small boxes**

Question 17

- **M1** Show general reasoning or calculation using consecutive even numbers (e.g. let numbers be $n, n+2, n+4$ or find specific three even numbers)
- **B1** Give a correct example of three consecutive even numbers that add to 48 (e.g. 14, 16, 18)
- **B1** Show correct addition to make 48 ($14 + 16 + 18 = 48$) cao
- Answer: **For example 14, 16 and 18. $14 + 16 + 18 = 48$**

Question 18

- **M1** Set up relations: if Ben = b then Ali = $2b$ and Cara = $2b - 5$, and write sum $2b + b + (2b - 5) = 83$
- **M1** Solve equation: $5b - 5 = 83 \Rightarrow 5b = 88 \Rightarrow b = 17.6$ seen or attempt to solve
- **B1** State that b is not a whole number so the split into whole carrots is not possible
- **B1** Conclude and justify: therefore they cannot share 83 carrots with given whole-number relations cao
- Answer: **Not possible because Ben would need 17.6 carrots, not a whole number**