



KS2.M-Y6N2 Order of Operations and Multi-Step Problems

Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Calculate $8 + 3 \times 5$.

(1)

2 Work out $(24 - 6) \div 3$.

(1)

3 Calculate $7 \times (10 - 4) + 9$.

(1)

4 Work out $5 + 18 \div 6 \times 3$.

(1)

5 Sana buys 3 packs of pencils. Each pack costs 95p. She pays with a 5.00 pound note. How much change does she get? Show working.

(2)

6 Calculate $150 - (24 \times 4) + 6$.

(1)

7 A rectangle is 8 m long and 3 m shorter than the width. The width is divided into 2 equal parts. Find the area of one part. Show your working.

(3)

8 Work out $3^2 + 4 \times 5$. Note: 3^2 means 3 squared.

(1)

9 Liam has 240 beads. He makes necklaces that use 15 beads each. He then shares the necklaces equally between 4 friends. How many beads does each friend get? Show working.

(2)

10 Calculate $420 \div (7 \times 3)$.

(1)

11 A recipe needs $2 \frac{1}{2}$ cups of flour. Emma wants to make 3 batches. How many cups of flour does she need in total? Give your answer as a mixed number.

(2)

12 Calculate $2 \times (45 - 28) + 36 \div 6$.

(1)

13 There are 3 boxes of biscuits. Each box contains $(4 + 2) \times 3$ biscuits. How many biscuits are there altogether?

(2)

14 Explain why the answers to $6 + 2 \times 5$ and $(6 + 2) \times 5$ are different. Give a clear reason.

(2)

15 A charity sells homemade cakes. Each cake costs £2.50. On Monday they sell 8 cakes, on Tuesday they sell twice as many as Monday, and on Wednesday they sell 5 fewer than Tuesday. How much money do they make in total over the three days? Show your working.

(3)

16 A gardener plants flower beds. Each flower bed needs $(12 - 3) \times 5$ bulbs. He plants 4 beds. How many bulbs does he plant altogether? Then, if bulbs are sold in packs of 10, how many full packs does he need? Show working.

(4)

- 17** Explain whether the following is always true, sometimes true or never true, and give a reason: "If you change the order that you add and multiply only numbers, the answer will stay the same." Use an example to support your explanation.

(6)

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- 18** A school orders sports equipment. A set of cones costs £12.50 and a set of bibs costs £9.75. The school orders 6 sets of cones and $(5 + 3)$ sets of bibs. They pay with a £200 school voucher. How much of the voucher is left? Show your working and give the answer to the nearest penny.

(6)

Mark scheme • KS2.M-Y6N2 Order of Operations and Multi-Step Problems

Question 1

- **B1** 23 cao
- Answer: **23**

Question 2

- **B1** 6 cao
- Answer: **6**

Question 3

- **B1** 51 cao
- Answer: **51**

Question 4

- **B1** 14 cao
- Answer: **14**

Question 5

- **M1** Correct subtraction of total cost from 5.00 or correct total cost seen, e.g. $3 \times 0.95 = 2.85$
- **B1** 2.15 or 2 pounds 15 pence cao
- Answer: **2.15**

Question 6

- **B1** 60 cao
- Answer: **60**

Question 7

- **M1** Correctly use width = length + 3 or substitute: width = $8 + 3 = 11$ seen
- **M1** Divide width by 2 and multiply by length or area method shown, e.g. $(11/2) \times 8$ seen
- **B1** 44 m² cao
- Answer: **44**

Question 8

- **B1** 29 cao
- Answer: **29**

Question 9

- **M1** Divide 240 by 15 to find number of necklaces, e.g. $240 \div 15 = 16$
- **B1** 60 cao
- Answer: **60**

Question 10

- **B1** 20 cao
- Answer: **20**

Question 11

- **M1** Multiply $2 \frac{1}{2}$ by 3 or convert to improper fraction $\frac{5}{2} \times 3 = \frac{15}{2}$ seen
- **B1** $7 \frac{1}{2}$ cao
- Answer: **$7 \frac{1}{2}$**

Question 12

- **B1** 40 cao
- **Answer: 40**

Question 13

- **M1** Evaluate $(4 + 2) \times 3 = 18$ or show multiplication per box
- **B1** 54 cao
- **Answer: 54**

Question 14

- **M1** Reference to order of operations, stating multiplication before addition or showing 2×5 done first for first expression
- **B1** Correct explanation that parentheses change the order so you add first in $(6 + 2) \times 5$ leading to different results cao
- **Answer: Multiplication is done before addition unless brackets change the order; $6 + 2 \times 5 = 6 + 10 = 16$ but $(6 + 2) \times 5 = 8 \times 5 = 40$**

Question 15

- **M1** Correctly find numbers sold each day, e.g. Monday 8, Tuesday 16, Wednesday 11
- **M1** Correctly find total cakes sold, e.g. $8 + 16 + 11 = 35$
- **B1** 87.50 or 87 pounds 50 pence cao
- **Answer: 87.50**

Question 16

- **M1** Evaluate bulbs per bed correctly: $(12 - 3) \times 5 = 9 \times 5 = 45$
- **M1** Multiply by number of beds: $45 \times 4 = 180$
- **M1** Divide by 10 to find packs or show ceiling, e.g. $180 \div 10 = 18$ seen
- **B1** 180 bulbs and 18 packs cao
- **Answer: 180 and 18**

Question 17

- **M1** Correct classification: answer states always true OR sometimes true OR never true
- **M1** If 'always true', gives a correct reason about commutative property for single operation examples; if 'sometimes true', explains that mixing operations changes order importance unless brackets are used
- **M1** Gives an example showing when order matters, e.g. $2 + 3 \times 4 = 2 + 12 = 14$ but $(2 + 3) \times 4 = 20$
- **M1** Explains role of brackets or order of operations in the example
- **B1** Clear conclusion that it is sometimes true: changing order of only additions is fine, but mixing addition and multiplication can change the result unless brackets are used cao
- **B1** Example calculation given and conclusion linked to example cao
- **Answer: Sometimes true; adding only numbers can be done in any order, but when addition and multiplication are mixed the order matters unless brackets are used, for example $2 + 3 \times 4 = 14$ but $(2 + 3) \times 4 = 20$**

Question 18

- **M1** Correctly evaluate number of bib sets: $(5 + 3) = 8$ seen
- **M1** Correctly find cost of cones: $6 \times 12.50 = 75.00$ seen
- **M1** Correctly find cost of bibs: $8 \times 9.75 = 78.00$ seen
- **M1** Add costs correctly: $75.00 + 78.00 = 153.00$ seen
- **B1** Correct subtraction from voucher: $200.00 - 153.00 = 47.00$ cao
- **B1** Final answer given to nearest penny as 47.00 or 47.00 cao
- **Answer: 47.00**