# Key Stage 2 SATs

## Mathematics Practice Test and Mark Scheme

## Paper 3: Reasoning

**THIRD SPACE**
**LEARNING**

**Third Space Learning**

| First name | |
|---|---|
| Last name | |
| Class | |
| Score | / 35 |

## Instructions

You **may not** use a calculator to answer any questions in this test.

## Questions and answers

- Follow the instructions for each question.
- Work as quickly and as carefully as you can.
- If you need to do working out, you can use the space around the question.
- Do not write over any barcodes.
- **Some questions have a method box like this**:

- For these questions, you may get a mark for showing your method.
- If you cannot do a question, **go on to the next one**.
- You can come back to it later, if you have time.
- If you finish before the end, **go back and check your work**.

## Marks

- The number under each line at the side of the page tells you the maximum number of marks for each question.

**1** What needs to be added to 783 to make 803?

**1 mark**

How many **tens** need to be subtracted from 4,270 to make 4,100?

**1 mark**

**2**  Circle the Roman numeral for 2009.

MMVIIII MMXI MMIX IXMM

**1 mark**

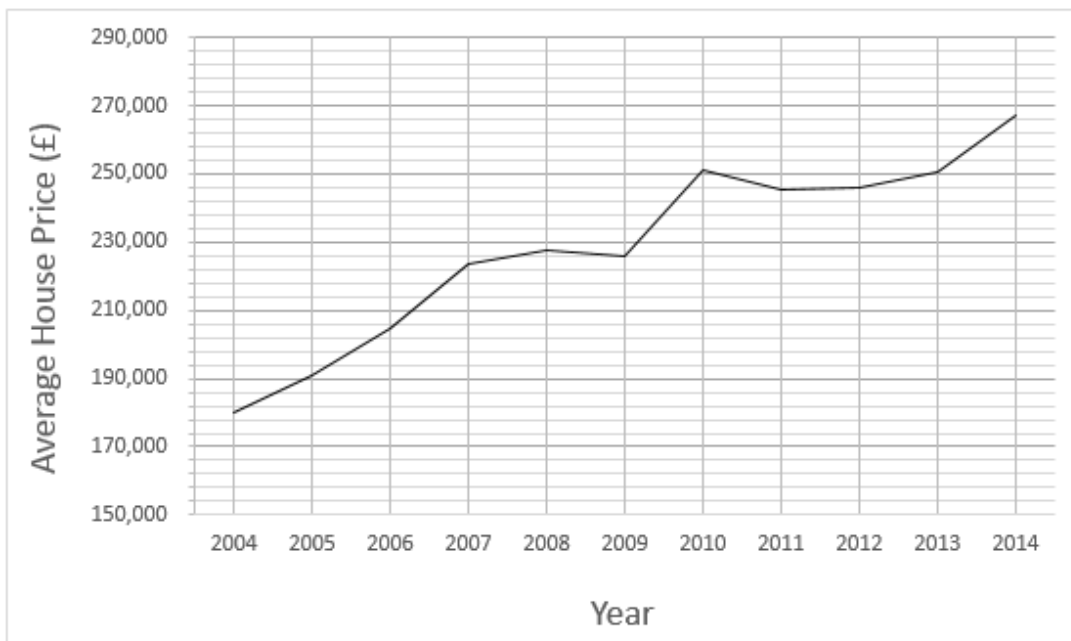Give your answer to this addition calculation in Roman numerals:

CLXXV + XLIV =

**1 mark**

**3** Find the two **square numbers** that add together to make 100.

_____ and _____

**1 mark**

**4** This line graph shows average house prices in the UK between 2004 and 2014:



In which **year** was the average UK house price approximately £20,000 lower than the average house price in 2009?

**1 mark**

By how much did property prices **increase** between 2009 and 2014?

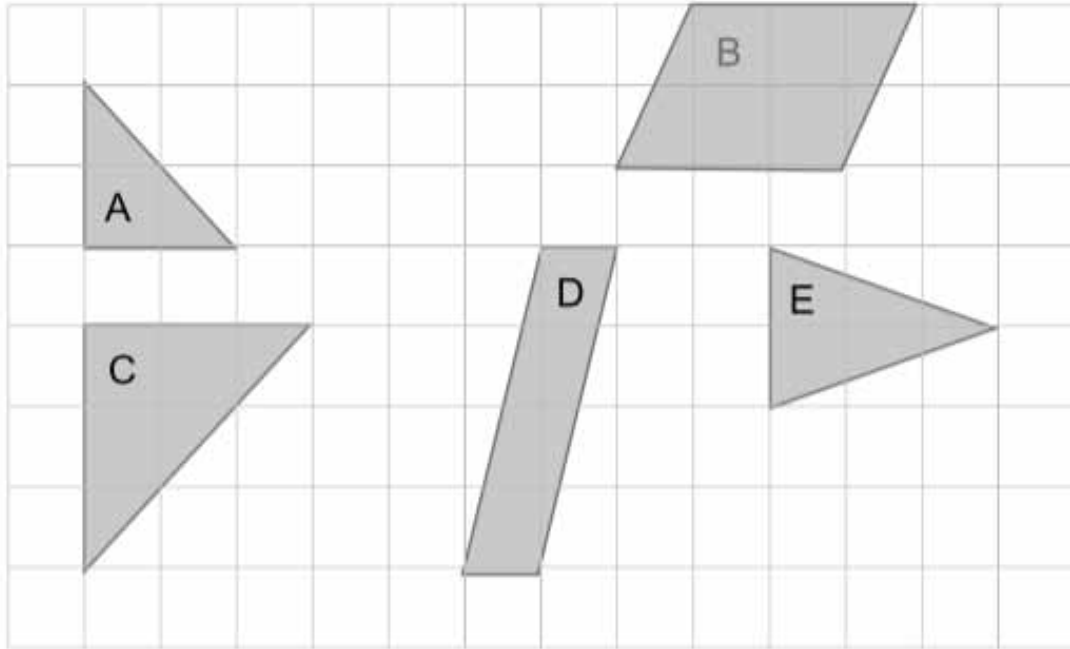**1 mark**

**5** Put the **same** number in each box to make the calculation correct.

$$140 + 10 - \boxed{\phantom{XXXX}} = \boxed{\phantom{XXXX}} - 30$$
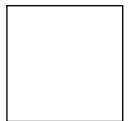
$\boxed{\phantom{XX}}$

**1 mark**

**6** Here are five shapes on a 1cm square grid:



Which two shapes together have a total area of 7cm²?

_____ and _____

**1 mark**

**7** Each row and column in this square has the same total.
Write the missing number in the empty square.

| 1.25 | 1.50 |      |
|------|------|------|
| 1.85 | 1.63 | 0.52 |
| 0.9  | 0.87 | 2.23 |

**1 mark**

**8**   2.46 x 8 =

1 mark

**9** On average a lion in a zoo eats 4950**g** of meat every day.

The meat comes in 6**kg** packs.

How many packs of meat does the zoo need to buy to feed the lion for one week?

Show your method.

**2 marks**

**10** It takes John 3.5 minutes to walk to the end of his road, how many seconds is this?

| seconds | |
|---|---|

**1 mark**

Wild elephants live to be approximately 42 months old. How many years and months is this?

| years and                     months | |
|---|---|

**1 mark**

**11** A florist stocks three types of roses; pink, white and red.

Half of all the roses are pink.
There are 28 red roses and there are twice as many white roses as red ones.
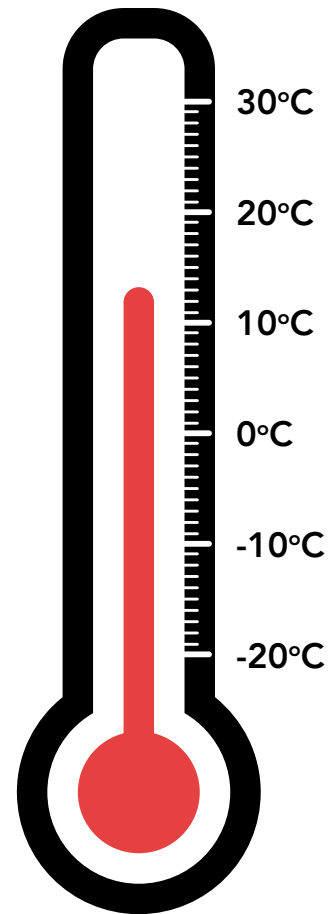The florist sells all of the roses at 20p each.
How much money does she receive for the roses?

Show your method.

£ 

2 marks

**12** The temperature fell by 17°C overnight. The thermometer shows the current temperature:

30°C

20°C

10°C

0°C

-10°C

-20°C

What was the temperature before it fell by 17°C?

°C

**1 mark**

**13** The formula used to calculate the perimeter $p$ of a rectangle is $p = 2 \times (a + b)$ where $a$ = length and $b$ = breadth.

What is the perimeter if $a$ = 5cm and $b$ = 3cm?

1 mark

What is $b$ if $p$ = 36cm and $a$ = 7cm?

1 mark

**14** A map has a scale of 1cm to 4km.

The road from Carton to Ambridge measures 5.8cm on the map.

How far is it from Carton to Ambridge in kilometres?

|  |  |
|---|---|
| km |  |

**1 mark**

**15**  Match each calculation to the correct answer.
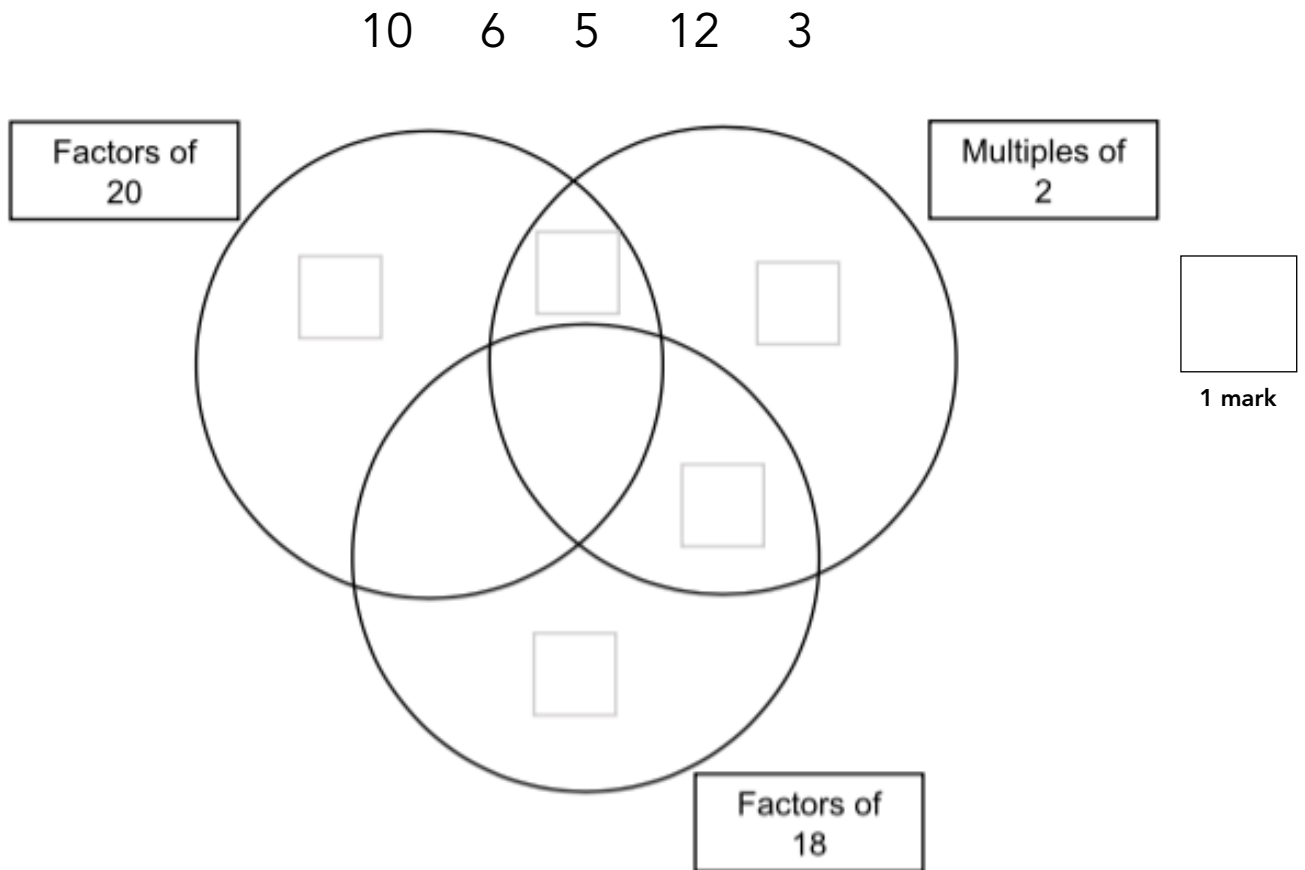
One has been done for you.

$4 + (4 \times 3) - 6$             27

$20 - 2 \times 7$                 10

$14 \div 2 + 5 \times 4$           29

$16 \div 8 - 2$                  0

$9 + 5 \times (7 - 3)$          6

**2 marks**

**16** Write each number in its correct box on the Venn diagram.

10   6   5   12   3

Factors of 20

Multiples of 2

Factors of 18

**1 mark**

Think of a number (that is not in the list above) that can go in the central section where all three circles overlap.

**1 mark**

**17**  Write these numbers in figures:

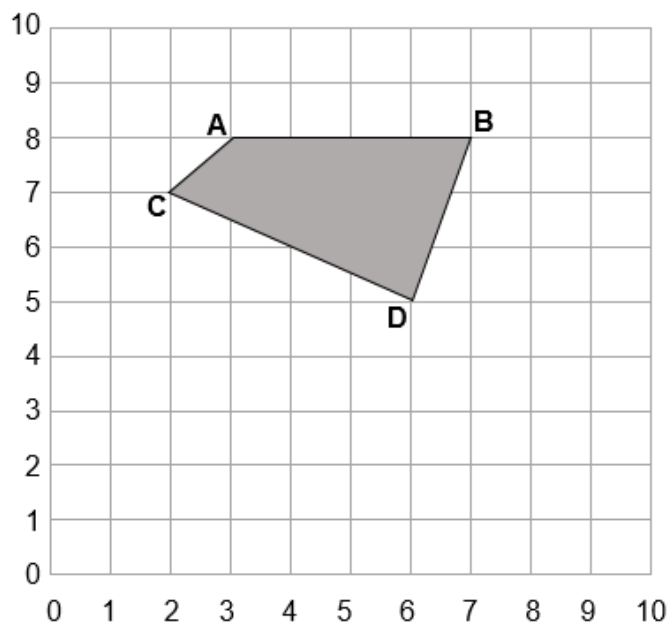Five thousand and twenty-five

1 mark

One hundred and seven
thousand, four hundred and fifty

1 mark

**18** A quadrilateral has been drawn on the co-ordinate grid below.
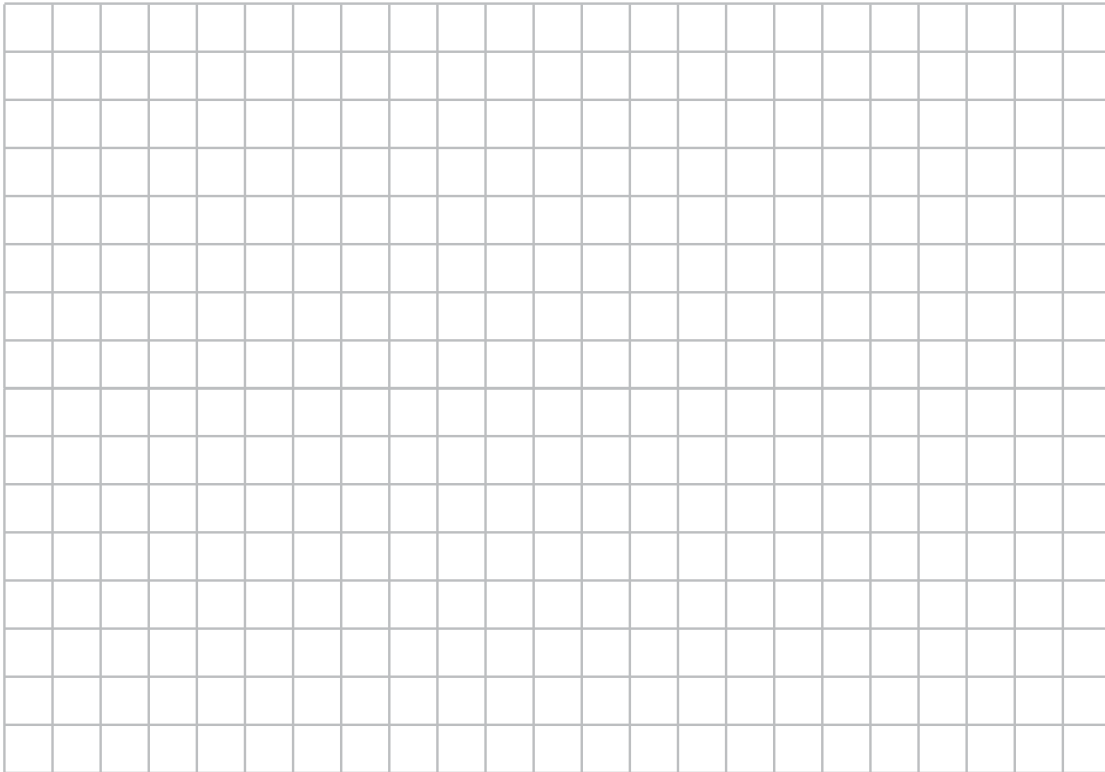


Where can you move corner B to make the shape a parallelogram?

(      ,      )

**1 mark**

**19** There are three 9 year olds to every five 10 year olds in Year 4. There are 88 children in Year 4.

How many are 10 years old?

2 marks

**20** Three friends won a total £6,000. Harriet won 40% of the total amount. Karl won 20% of the total amount. How much did Suresh win? Show your working out.

**2 marks**

**21** Containers of sweets are packed in a box that is 40cm wide, 30cm long and 30cm high.

How many containers of sweets can fit in this box if each one is 10cm x 6cm x 2cm?

**3 marks**

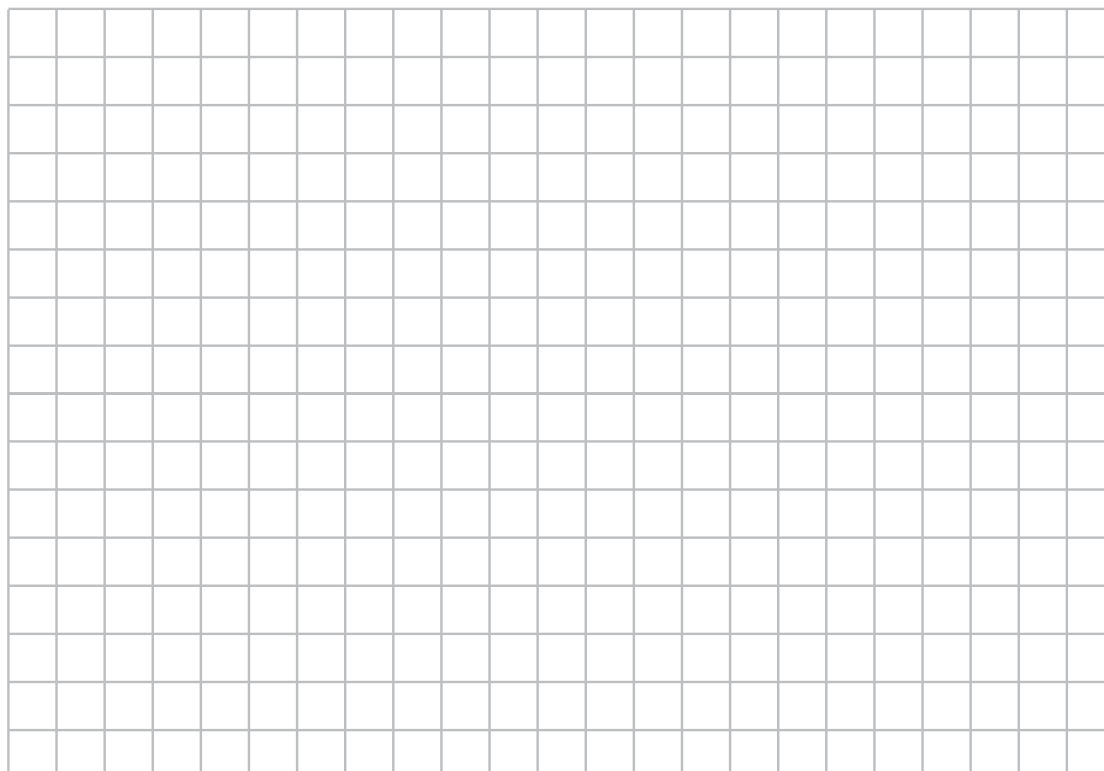The instructions and principles of this mark scheme closely follow the guidance in the 2016 national curriculum tests. We have deliberately not set a limited time for the test paper as a teacher may want to very it according to the standard individual children are working at.

The national curriculum test allows 40 minutes to complete this test.

**Demand Descriptors**

T  = Working towards expected standard
E  = Working at expected standard
G = Working at greater depth within expected standard

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 1 | a. 20 | 1m | Do not accept 170 | 3N3 | Number | T |
|   | b. 17 | 1m | | 4N3a | | T |
| 2 | a. MMIX | 1m | Accept alternative unambiguous indications, e.g. Roman numerals ticked or underlined Do not accept 219 | 5N3b | Number | E |
|   | b. CCXIX | 1m | | 5N3b | | G |
| 3 | 36 and 64 | 1m | | 5C5d | Calculation | E |
| 4 | a. 2006 | 1m | | 5S2 | Statistics | T |
|   | b. £40,000 | 1m | | 5S2 | | T |
| 5 | 140 + 10 - **90** = **90** - 30 | 1m | | 3C4 | Calculation | G |
| 6 | D and E | 1m | | 6M7b | Measures | E |
| 7 | 1.25 | 1m | | 6F9b | Fractions | E |
| 8 | 19.68 | 1m | | 6F9b | Fractions | E |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 9 | Award TWO marks for the correct answer of 6. If the answer is incorrect award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g.<br><br>4950 x 7 = 34,650g<br>34,650 ÷ 1,000 = 34.65kg<br>34.65 ÷ 6 = 5.775 packs<br>OR<br>4.95 x 7 =34.65kg<br>34.65 ÷ 6 = 5.775 packs<br>OR<br>4950 x 7 = 34,650g<br>34,650g ÷ 6,000 = 5.775<br>OR<br>Uses rounded mass:<br>Lion eats 5kg each day = 35kg each week<br>Needs 6 packs to provide 36kg | Up to 2m<br><br><br><br><br>1m<br><br><br>1m<br>1m<br>1m<br><br>1m | Accept for ONE mark an answer of 5.775, as evidence of an appropriate method.<br><br>OR<br><br>The lion eats approx. 35kg each week | 6F10 | Fractions | G<br>G |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 10 | a. 210 seconds | 1m | | 4M4c | Measures | T |
| | b. 3 years and 6 months | | | 4M4c | | T |
| 11 | Award TWO marks for the correct answer of £33.60 If the answer is incorrect award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g.  White = 28 x 2 = 56 White + red = 56 + 28 = 84 Pink = 84 84 + 84 = 168 168 x 20 = 3360p | Up to 2m | Accept for TWO marks a clear indication of the correct amount, e.g. £33.60p  Accept for ONE mark an answer of £3360, £336.0 or £3360p as evidence of an appropriate method. | 5C8b | Calculation | G  G |
| 12 | 30°C | 1m | | 5N5 | Number | E |
| 13 | a. 16cm | 1m | | 6A2 | Algebra | E |
| | b. 11cm | 1m | | 6A2 | | E |
| 14 | 23.2km | 1m | | 6R3 | Ratio and proportion | E |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 15 | Award TWO marks for all 4 correct:<br><br>Award ONE mark for 2 or 3 correct. | Up to 2m | | 6C9<br>6C9 | Calculation | E<br>E |
| 16 | a. Award ONE mark for all five numbers positioned correctly.<br> | 1m | | 6C5 | Calculation | E |
| | b. 2 | 1m | | 6C5 | | E |
| 17 | a. 5,025 | 1m | | 6N2 | Number | E |
| | b. 107,450 | 1m | Accept 413g | 6N2 | | E |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 18 | Move corner B to (7, 6) | 1m | | 6G2a | Geometry | E |
| 19 | Award TWO marks for the correct answer of 55.<br><br>If the answer is incorrect, award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g.<br><br>3 + 5 = 8<br>88 ÷ 8 = 11<br><br>1 part = 11<br>11 x 5 = 54 (error) | 2m | | 6R1 | Calculation | G |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 20 | Award TWO marks for the correct answer of £2,400<br><br>If the answer is incorrect award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g.<br><br>£6,000 ÷ 5 = £1,200<br>£1,200 x 2 = £2,400 (Harriet)<br>20% of £6,000 = £1,200 (Karl)<br>£1,200 + £2,400 = £3,600<br>£6,000 - £3,600 = £2,400 | Up to 2m | Accept for TWO marks a clear indication of the correct amount, e.g. £2,400p<br><br>Accept for ONE mark the correct amount for either Harriet or Karl | 6F11<br>6F11 | Fractions | E<br>G |

| Q | Required answer | Mark | Acceptable answer or additional guidance | Content Domain Ref | NC strand | Level of demand |
|---|---|---|---|---|---|---|
| 21 | Sight of 36,000cm$^2$ AND 120cm$^2$ Evidence of appropriate methods with no more than one arithmetic error<br><br>Volume of box:<br><br>40 x 30 x 30 = 36,000cm$^2$<br><br>Volume of one sweet container:<br><br>10 x 6 x 2 = 120cm$^2$<br>36,000 ÷ 120 = 300 | Up to 2m | TWO marks can be awarded if a misread number is followed through correctly<br><br>OR<br><br>If an answer of 270 is given, award TWO marks as evidence of the correct method but incorrect packing arrangement choice. | 5M9d<br>5M9d<br>5M9d | Measures | E<br>E<br>G |

## Balance of difficulty
## of questions in the paper

3 marks at working towards
25 marks at the expected standard
7 marks at working at greater depth

## Thresholds

Working towards the expected standard: Criteria for 'working at the expected standard' have not been met.

Working at the expected standard: at least 13 of the 25 'expected' marks are obtained, together with all 3 of the working towards marks, but none of the 7 marks graded 'greater depth'. This mark is 16 out of 35.

Working at greater depth: all of the 3 working toward marks are obtained, plus at least 90% of the 'expected' marks and at least 50% of the 'greater depth' marks. This mark is 29 out of 35.

# Third Space Learning
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Lisa Graham, Deputy Head, St Hughes C-of-E Primary

"My tutor understands when I don't get things right. She helps me through at a steady pace and always believes I can do it :)"

Millie, Year 5, Worcester