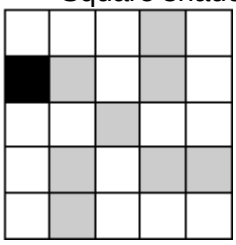
M1. Square shaded as shown.



Shading is not essential provided the choice of square is unambiguous.

[1]

M2. Award **TWO** marks for the correct answer of A, C, E.

Accept letters in any order.

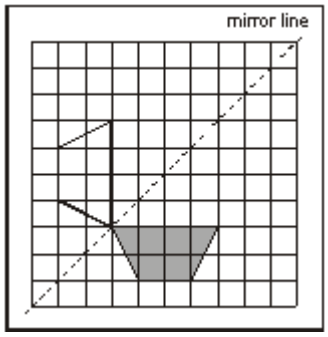
Accept for **ONE** mark either three correct letters and one additional letter **OR** two correct letters and up to one incorrect letter.

Accept alternative, unambiguous indications, eg ticks or mirror lines drawn on the correct shapes.

Up to 2

[2]

M3. Diagram completed as shown:



Accept slight inaccuracies in drawing, provided the intention is clear.

Vertices must be within 2mm of the correct grid points.

The reflection need not be shaded.

[1]

M4. Award **TWO** marks for the correct answers of A **AND** E.

Answers may be given in either order.

Accept unambiguous indications on the diagram.

If the answer is incorrect, award **ONE** mark for:

- only one answer correct

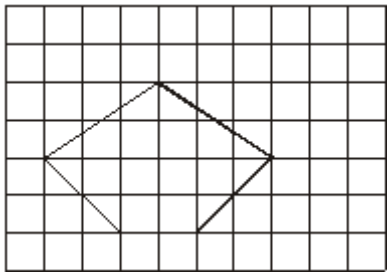
OR

- two answers correct and one incorrect.

Up to 2

[2]

M5. Two more lines drawn as shown:



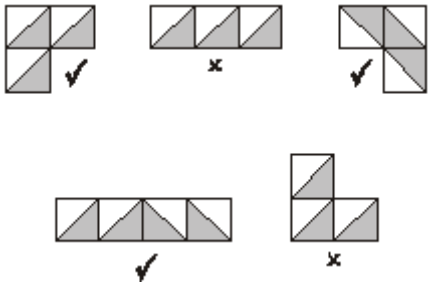
Accept slight inaccuracies in drawing.

***Do not** accept lines drawn outside of the grid.*

Ignore line of symmetry if drawn.

[1]

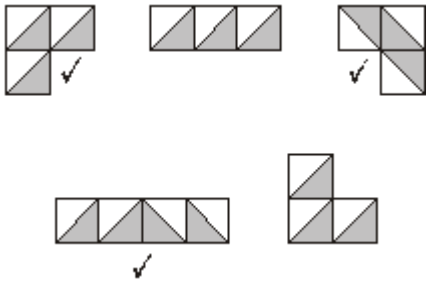
M6. Award **TWO** marks for diagrams ticked or crossed as shown:



If the answer is incorrect, award **ONE** mark for any four diagrams ticked or crossed correctly.

*Accept: alternative unambiguous indications such as **Y** or **N**.*

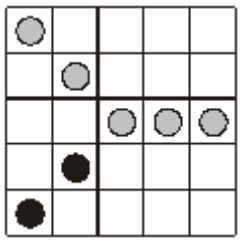
*For **TWO** marks accept:*



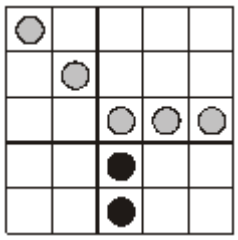
Up to 2

[2]

M7. Diagram completed correctly as shown:



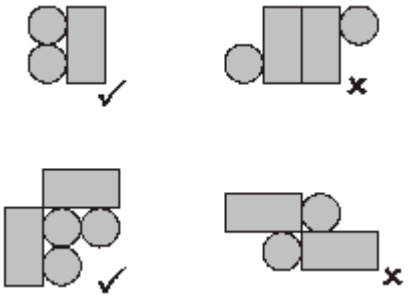
OR



Accept alternative unambiguous indications, eg squares shaded, ticked or crossed.

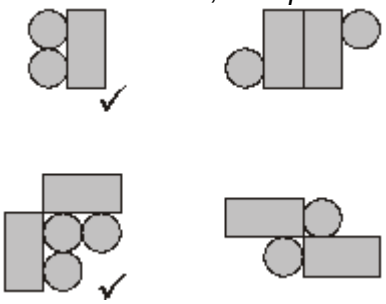
[1

M8. Award **TWO** marks for diagrams ticked or crossed as shown:



*Accept alternative unambiguous indications, eg **Y** or **N**.*

*For **TWO** marks, accept:*



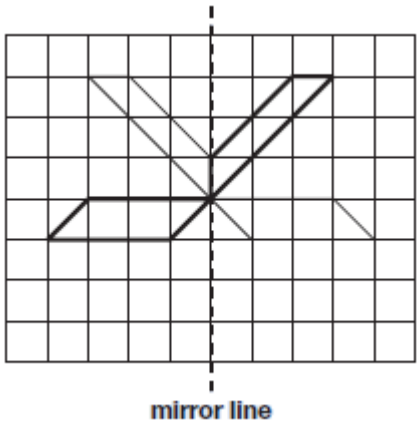
*For **TWO** marks accept lines of symmetry drawn on the correct two shapes and the other two shapes left blank.*

If the answer is incorrect, award **ONE** mark for three diagrams ticked or crossed correctly.

Up to 2

[2]

M9. Diagram completed as shown:



Accept slight inaccuracies in drawing.

[1]

M10. (a) C

Accept 18

1

(b) D

1

[2]

M11. Award **TWO** marks for the correct answer of A **AND** B

If the answer is incorrect, award **ONE** mark for:

- A only

OR

- B only

OR

- A **AND** B **AND** not more than one incorrect letter.

Accept alternative unambiguous indication.

Up to 2

[2]

E1. This question required children to shade in one more square so that this design has rotational symmetry of order 4.

This is quite a complex instruction, but children appeared to understand what was required, with half those reaching level 3 overall, four fifths of those reaching level 4 and 95% of those reaching level 5 correctly completing the design. The most common mistake was to shade in a square to 'reflect' the top part of the shape in a central vertical mirror line, completely ignoring the fact that this 'reflection' did not apply to the bottom part of the shape. The performance of children in this question suggests a better understanding of rotation than in previous years.

E2. This question was worth two marks. Children achieving level 3 overall were less likely to correctly identify all three shapes with reflective symmetry than those achieving level 5, who were nearly always awarded both marks. However, most children were awarded at least one mark for this question, which shows partial understanding.

Children were least likely to correctly identify shape E as having reflective symmetry; this was the only shape with a diagonal line of symmetry. Shape A, with a vertical line of symmetry, was given more often than shape C, where the line of symmetry was horizontal. Shape D was the incorrect response most often listed; this was probably because it came close to having a vertical line of symmetry. Shapes B and F were rarely chosen, which suggests that the children knew the difference between reflective and rotational symmetry.

E4. Target Level: 3

Curriculum Coverage (POS ref: Ma4/2c)

This question assesses children's ability to recognise line symmetry in different shapes. Children are required to identify two shapes with a line of symmetry from a selection of five shapes.

Performance

Only one third of children working at Level 3 correctly identified the two shapes for two marks. Seventy per cent of children working at Level 4, and over 90% of those working at Level 5, were also awarded two marks.

Over half of children working at Level 3 identified one of the two shapes correctly for one mark. Almost one-quarter of children working at Level 4 and about 5% of those working at Level 5 were also awarded one mark.

Common errors and misconceptions

- Children working at all Levels were more successful at identifying shape E than shape A. Shape E may have appeared more obviously symmetrical because the line of symmetry passes through two vertices.
- Of those children who identified only one of the two shapes, there was little difference among girls regarding which of the two shapes they chose. However, boys were twice as likely to choose shape E as shape A.

E5. Target Level: 4

Curriculum Coverage (POS ref: Ma3/2c, 3b)

This question assesses pupils' understanding of line symmetry. They are required to add two more lines to a partially drawn shape on a square grid to make a shape with a line of symmetry.

Performance

- Over 60% of pupils working at level 4 completed the shape correctly, as did over 85% of pupils working at level 5 and almost 30% of those working at level 3.

Common errors and misconceptions

- Just over 5% of pupils working at level 4 and nearly 10% of those working at level 3 attempted to draw the correct completed shape, but did not meet the level of accuracy required for the award of the mark. because their two lines did not meet within 2mm of the correct intersection on the grid.

- Over 5% of pupils working at level 4 and almost 15% of those working at level 3 completed the shape incorrectly with one vertical and one horizontal line. This was possibly an attempt to complete a shape with a horizontal line of symmetry. Alternatively, they may have thought that their vertical line formed the line of symmetry of a larger shape.

Resource currently unavailable.