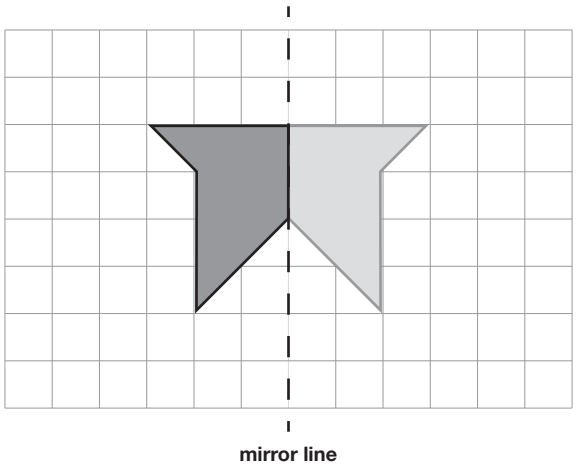
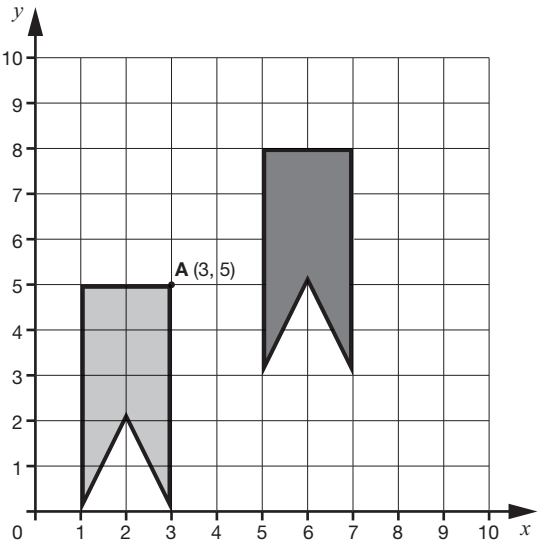
8. Mark schemes for Paper 2: reasoning

Qu.	Requirement	Mark	Additional guidance
1	Diagram completed, as shown:  	1m	Accept slight inaccuracies in drawing (see page 12 for guidance). Shape need not be shaded for the award of **ONE** mark.
2	Correct addition calculation, as shown: $\begin{array}{r} \boxed{2}\boxed{8} \\ +\ \boxed{6}\boxed{7} \\ \hline \boxed{9}\boxed{5} \end{array}$ **OR** $\begin{array}{r} \boxed{6}\boxed{7} \\ +\ \boxed{2}\boxed{8} \\ \hline \boxed{9}\boxed{5} \end{array}$	1m	All 6 digit cards must be completed correctly for the award of **ONE** mark.
3	A point on the line in the range 6.6 cm to 6.8 cm inclusive from A.	1m	
4	Both values correct, as shown: $\frac{3}{4} = \frac{9}{\boxed{12}} = \frac{\boxed{18}}{24}$	1m	Both values must be correct for the award of **ONE** mark.

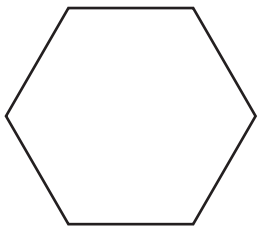
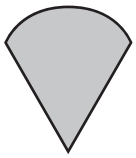
Qu.	Requirement	Mark	Additional guidance
5a	7	**1m**	**Do not** accept –7 or 7–
5b	Oslo	**1m**	Accept unambiguous abbreviations or recognisable misspellings.
6	299,604	**1m**	
7	Both boxes ticked, as shown: Tick **two**. 0.25 ✓ 0.75 ☐ $\frac{25}{100}$ ✓ 0.5 ☐ $\frac{2}{5}$ ☐	**1m**	As pupils are told to select **two** boxes, alternative unambiguous positive indications, e.g. Y, of the correct answer are accepted. Both correct boxes must be ticked for the award of the mark. No additional boxes must be ticked.
8	Award **TWO** marks for the correct answer of 192 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 48 × 3 = 144 24 × 2 = 48 144 + 48 = **OR** • 48 + 48 + 48 = 144 24 + 24 = 48 144 + 48 = **OR** • 4 × 48 **OR** • 8 × 24	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark.

<table>
<tr><th>Qu.</th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>9</td><td>Explanation that recognises that the sequence does not always increase by four, with clear reference to the data, e.g.
• The difference between 1996 and 1999 is three years, not four so it is not always every four years
• It would be 2000 if it was every 4 years
• It should have ended in 2016
OR
Explanation that demonstrates that the sequence does not always increase by 4, but does not reference specific years from the data, e.g.
• The cricket world cup was sometimes 3 years apart instead of 4 years apart
• Not all of the years have 4 years difference between.</td><td>1m</td><td>Do not accept vague or incomplete explanations, e.g.
• It does not always increase by four
• It should be 2000
• The difference can be 3, 4 or 5 years at different times.
Do not accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation, e.g.
• 1992 + 4 = 1996 + 3 = 1999</td></tr>
<tr><td>10</td><td>Award TWO marks for all symbols correct, as shown:
11 × 12 | < | 15 × 10
90 ÷ 30 | = | 60 ÷ 20
120 ÷ 4 | > | 160 ÷ 8
30 × 8 | < | 100 × 10
Award ONE mark for any three symbols correct.</td><td>Up to 2m</td><td></td></tr>
<tr><td>11</td><td>Award TWO marks for the table completed, as shown:
<table><tr><th>Number of faces</th><th>Number of vertices</th><th>Number of edges</th></tr><tr><td>6</td><td>8</td><td>12</td></tr></table>
Award ONE mark for two correct numbers, correctly placed.</td><td>Up to 2m</td><td></td></tr>
</table>

Qu.	Requirement	Mark	Additional guidance
12	Shape located correctly, as shown:  	**1m**	Accept slight inaccuracies in drawing (see page 12 for guidance). Shape need not be shaded for the award of **ONE** mark.
13	Correct number circled, as shown: $\frac{67}{8}$ $\frac{48}{8}$ $\frac{62}{8}$ $\frac{55}{8}$ $\frac{76}{8}$	**1m**	Accept alternative unambiguous positive indication of the correct answer, e.g. fraction ticked.
14	Fractions written in the correct order, as shown: $\frac{3}{5}$ $\frac{3}{4}$ $\frac{6}{5}$	**1m**	Accept the fraction joined to the correct box, rather than written in it. **Do not** accept transcription errors or misreads for this question.

Qu.	Requirement	Mark	Additional guidance
15	Award **TWO** marks for the correct answer of 1800 If the answer is incorrect, award **ONE** mark for evidence of appropriate complete method with no more than one arithmetic error, e.g. • 40 × 15 = 500 *(error)* 500 × 3 = 1500 If no answer is given, the first part of the calculation must be evaluated correctly for the award of **ONE** mark, e.g. • 15 × 3 = 45 45 × 40 = **OR** • 40 × 15 = 600 600 × 3 = **OR** • 40 × 3 = 120 120 × 15 =	**Up to 2m**	**Do not** accept sight of a correct multiplication, e.g. 40 × 15 × 3, for **ONE** mark unless part of the calculation is evaluated correctly. Misreads are **not** allowed.
16	Award **TWO** marks for two boxes ticked correctly, as shown: add 3 then subtract 90 ☐ subtract 100 then add 3 ☑ subtract 7 then subtract 90 ☑ subtract 3 then subtract 100 ☐ If the answer is incorrect, award **ONE** mark for: • only one box ticked correctly and no incorrect boxes ticked **OR** • two boxes ticked correctly and one incorrect box ticked.	**Up to 2m**	Accept alternative unambiguous positive indication of the correct answer, e.g. Y.

Qu.	Requirement	Mark	Additional guidance
17	Award **THREE** marks for the correct answer of 1.7 (litres) or 1,700 (ml). If the answer is incorrect, award **TWO** marks for: • sight of 6,300 **OR** 6.3 as evidence of the multiplication completed correctly **OR** • evidence of an appropriate complete method with no more than one error, e.g. • 28 × 225 = 6,300 8 litres = 8,000 ml 8,000 – 6,300 = 2,700 *(error)* Award **ONE** mark for evidence of an appropriate method, e.g. • 8,000 – 28 × 225 =	**Up to 3m**	Unit need not be given for the award of **THREE** marks. An incorrect unit is treated as **one** error. A misread may affect the award of marks. No marks are awarded if there is more than one misread or if the mathematics is simplified. **TWO** marks will be awarded for an appropriate complete method with the misread number followed through correctly. **ONE** mark will be awarded for evidence of an appropriate complete method with the misread number followed through correctly with one arithmetic error. If the answer reached in the first part of the calculation gives an answer greater than 8(L) or 8000(ml) and the smaller value is then subtracted from it, **ONE** mark may still be available. Answer need not be obtained for the award of **ONE** mark.
18	Award **TWO** marks for the correct answer of £5.50 If the answer is incorrect, award **ONE** mark for: • sight of 22 ÷ 4 **OR** • evidence of appropriate method, e.g. • 3 tickets cost 3 × £5 = £15 1 ticket costs £7 £15 + £7 = £22 £22 ÷ 2 ÷ 2	**Up to 2m**	For **ONE** mark, accept an answer of £550, £550p or £5.5 as evidence of appropriate method. Answer need not be obtained for the award of **ONE** mark.

Qu.	Requirement	Mark	Additional guidance
19	Third box only ticked correctly, as shown: 3 – 2 + 2 ☐ 4 – 2 + 1 ☐ 4 – 2 + 2 ☑ 3 – 2 + 1 ☐	**1m**	Accept alternative unambiguous positive indication of the correct answer, e.g. Y.
20	Award **TWO** marks for the correct answer of 30 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 17.5 × 12 = 210 15 × 12 = 180 210 –180 = **OR** • 2.5 × 12 =	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark.
21a	 = **36**	**1m**	
21b	 = **25**	**1m**	Award **ONE** mark for an answer of • (147 – 2 × answer for box 1) ÷ 3 **OR** • (111 – answer for box 1) ÷ 3 Any follow-through fraction or decimal answer must be expressed as an exact value.
22	125	**1m**	

Qu.	Requirement	Mark	Additional guidance
23	Award **TWO** marks for the correct answer of 1,408 **OR** for an answer in the range of 1,406 to 1,409 inclusive. If the answer is incorrect, award **ONE** mark for: • sight of 1,392 **OR** • evidence of an appropriate method, e.g. • $24 \times 58\frac{2}{3}$ = answer • 24 × 58 = 1,394 *(error)* $\frac{2}{3}$ of 24 = 16 1,394 + 16 = answer • $24 \times \frac{176}{3}$ = answer • 24 × 58.67 = answer.	**Up to 2m**	A final answer is required for the award of **ONE** mark. Within an appropriate method, if a decimal equivalent for $\frac{2}{3}$ is given, it must be rounded or truncated to at least 2 decimal places.