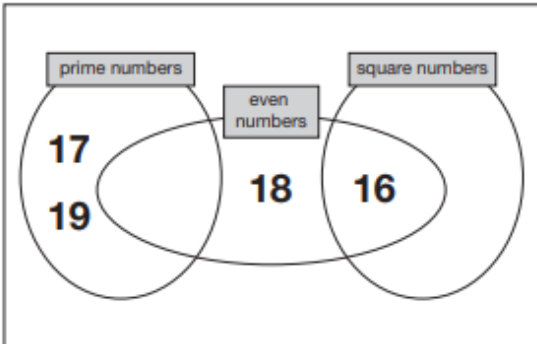
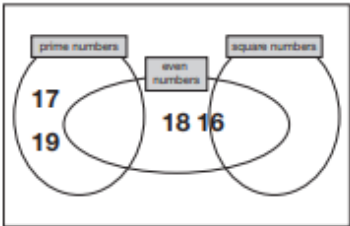
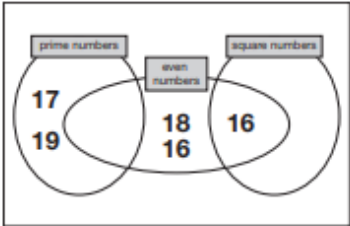
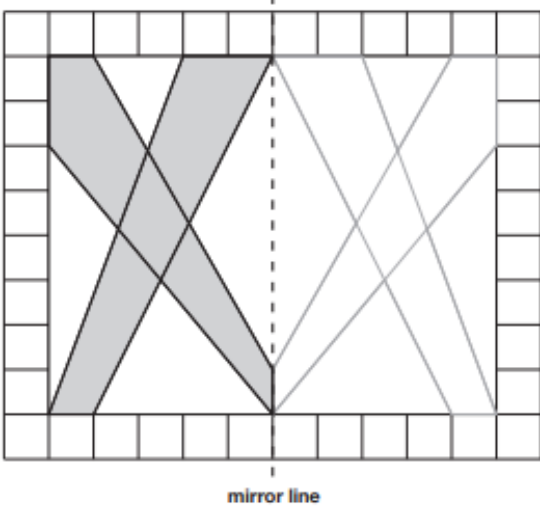
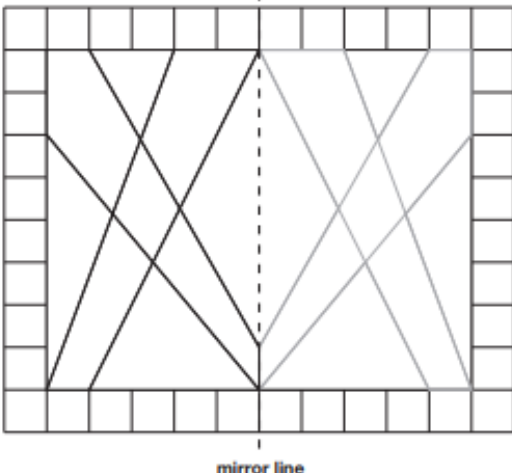
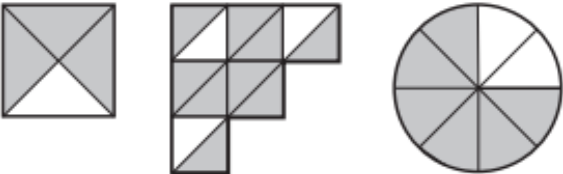


8. Mark schemes for Paper 2: reasoning

Qu.	Requirement	Mark	Additional guidance
1a	499	1m	
1b	555	1m	
2	Award ONE mark for the correct answer as shown: <ul style="list-style-type: none"> <u>E</u> <u>B</u> <u>C</u> <u>D</u> <u>A</u> 	1m	Accept: <ul style="list-style-type: none"> <u>£91,500</u> <u>B</u> <u>£130,500</u> <u>£131,500</u> <u>£135,300</u>
3	Award TWO marks for: $\begin{array}{r} 15\boxed{1} \\ + 4\boxed{6}4 \\ \hline \boxed{6}15 \end{array}$ <p>If the answer is incorrect, award ONE mark for two digits correct.</p>	Up to 2m	
4a	191,118	1m	
4b	48,361	1m	
5	Award TWO marks for all four numbers placed correctly as shown:  <p>If the answer is incorrect, award ONE mark for three numbers placed correctly.</p>	Up to 2m	Accept alternative unambiguous indications, e.g. lines drawn from the numbers to the appropriate regions of the diagram. Do not accept numbers written in more than one region, e.g.  OR 

Qu.	Requirement	Mark	Additional guidance
6	<p>Diagram completed correctly as shown:</p> 	1m	<p>Accept inaccurate drawing, provided the intention is clear.</p> <p>Diagram need not be shaded.</p> <p>Diagram need not include edges drawn along the gridlines, e.g.</p> 
7a	$\boxed{2} \div 3 = \frac{8}{12} = \frac{4}{\boxed{6}}$	1m	
7b		1m	
8	<p>Numbers circled as shown:</p> <p>$\textcircled{0.05}$ 0.23 $\textcircled{0.2}$ 0.5</p>	1m	<p>Accept alternative unambiguous positive indications, e.g. numbers ticked or underlined.</p>
9	<p>Award TWO marks for the correct answer of 25p</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> • $168 \div 2 = 84$ 109 – 84 <p>OR</p> <ul style="list-style-type: none"> • $168 \div 6 = 28$ $3 \times 28 = 84$ 109 – 84 	Up to 2m	<p>Accept for TWO marks, an answer given in the acceptable notation (see page 10 for guidance).</p> <p>Answer need not be obtained for the award of ONE mark.</p> <p>Accept for ONE mark an answer of 0.25p OR £25p OR £25 as evidence of an appropriate method.</p>

Qu.	Requirement	Mark	Additional guidance
10	<p>Award TWO marks for all three diagrams completed to show three-quarters shaded, e.g.</p>  <p>If the answer is incorrect, award ONE mark for two diagrams correct.</p>	Up to 2m	Accept alternative unambiguous indications of parts shaded.
11	<p>Award TWO marks for the correct answer of 30</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> • $1.5 \text{ kg} = 1,500\text{g}$ $1,500 \div 50$ 	Up to 2m	<p>Answer need not be obtained for the award of ONE mark.</p> <p>Units must be converted correctly for the award of ONE mark.</p>
12a	53	1m	
12b	48	1m	
13	<p>Award TWO marks for the correct answer of 119</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> • $140 \div 20 = 7$ $3 \times 7 = 21$ $140 - 21$ <p>OR</p> <ul style="list-style-type: none"> • $140 \div 20 = 7$ $20 - 3 = 17$ 17×7 	Up to 2m	Answer need not be obtained for the award of ONE mark.

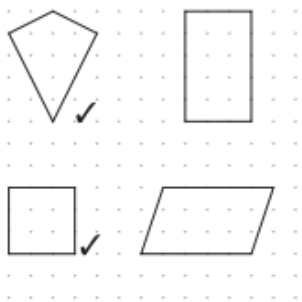
Qu.	Requirement	Mark	Additional guidance
14	24 AND 48 only	1m	Numbers may be given in either order.
15	<p>Award TWO marks for the correct answer of 77 °F</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> • $86 - 68 = 18$ $18 \div 2 = 9$ $9 + 68$ <p>OR</p> <ul style="list-style-type: none"> • $86 - 68 = 18$ $18 \div 2 = 9$ $86 - 9$ <p>OR</p> <ul style="list-style-type: none"> • $86 + 68 = 154$ $154 \div 2$ 	Up to 2m	Answer need not be obtained for the award of ONE mark.
16a	9,999,995	1m	
16b	5,900,000	1m	
17a	160	1m	
17b	20	1m	If the answers to a and b are incorrect, award ONE mark if $a + b = 180^\circ$ unless b is between 33° and 37° inclusive, or 90°
18	20	1m	

Qu.	Requirement	Mark	Additional guidance
19	<p>Award THREE marks for the correct answer of £111.70</p> <p>If the answer is incorrect, award TWO marks for:</p> <ul style="list-style-type: none"> sight of £90 AND £7.90 AND £13.80 as all multiplication steps completed correctly <p>OR</p> <ul style="list-style-type: none"> evidence of an appropriate complete method with no more than one arithmetic error, e.g. $\begin{array}{r} 7.50 \\ \times 12 \\ \hline 88.80 \\ \text{(error)} \end{array} \quad \begin{array}{r} 79 \\ \times 10 \\ \hline 790 \end{array} \quad \begin{array}{r} 6.90 \\ \times 2 \\ \hline 13.80 \end{array}$ <p>$88.80 + 7.90 + 13.80 = 110.50$</p> <p>Award ONE mark for evidence of an appropriate complete method.</p>	Up to 3m	<p>Accept for TWO marks, sight of 9,000p AND 790p AND 1,380p as all multiplication steps completed correctly.</p> <p>Answer need not be obtained for the award of ONE mark.</p> <p>A misread of a number may affect the award of marks. No marks are awarded if there is more than one misread or if the mathematics is simplified.</p> <p>TWO marks will be awarded if an appropriate complete method with the misread number is followed through correctly.</p> <p>ONE mark will be awarded for:</p> <ul style="list-style-type: none"> all multiplication steps completed correctly with the misread number <p>OR</p> <ul style="list-style-type: none"> evidence of an appropriate complete method with the misread number followed through correctly with no more than one arithmetic error.
20	(-10, -40)	1m	

Qu.	Requirement	Mark	Additional guidance
1	<p>Award TWO marks for numbers in order as shown:</p> <p>68 82 96 110 124 138 152</p> <p>If the answer is incorrect, award ONE mark for two numbers correct.</p>	Up to 2m	
2a	9	1m	Do not accept -9 or 9-
2b	-6	1m	Do not accept 6-
3	<p>Both clocks ticked, as shown:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">03:45</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">02:45</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">09:45</div> </div> <p style="text-align: center;">✓</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">21:45</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">14:45</div> </div> <p style="text-align: center;">✓</p>	1m	Accept alternative unambiguous positive indications, e.g. clocks circled or underlined.
4a	▲ = 32	1m	<p>If the answers to ● and ▲ are incorrect, award ONE mark if</p> <p>▲ + ● = 50 unless ● = 25</p>
4b	● = 18	1m	
5	<p>Numbers in order, as shown:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">0.098</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">0.607</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">0.78</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">4.003</div> <div style="border: 1px solid black; padding: 2px 10px; margin: 5px;">5.6</div> </div>	1m	

Qu.	Requirement	Mark	Additional guidance
6	<p>Award TWO marks for the correct answer of 1.07</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> $1.28 + 1.65 = 2.93$ $4 - 2.93$ <p>OR</p> <ul style="list-style-type: none"> $4 - 1.28 = 2.72$ $2.72 - 1.65$ <p>OR</p> <ul style="list-style-type: none"> $4 - 1.65 = 2.35$ $2.35 - 1.28$ 	Up to 2m	<p>Accept for ONE mark an answer of 107 metres as evidence of an appropriate method.</p> <p>Answer need not be obtained for the award of ONE mark.</p>
7a	c AND e	1m	Letters may be given in either order.
7b	a AND d	1m	Letters may be given in either order.
8	<p>Award TWO marks for the correct answer of 35p OR £0.35</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> $50p + 20p + 10p + 10p + 5p = 95p$ $£2.00 - 95p = £1.05$ $£1.05 \div 3$ 	Up to 2m	<p>Accept for ONE mark an answer of £35 OR £35p OR 0.35p as evidence of an appropriate method.</p> <p>Answer need not be obtained for the award of ONE mark.</p>
9a	46	1m	The answer is a time interval (see page 10 for guidance).
9b	10:44	1m	The answer is a specific time (see page 11 for guidance).
10	C	1m	Accept 18
11	<p>Award TWO marks for the correct answer of 2,970</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method with no more than one arithmetic error, e.g.</p> <ul style="list-style-type: none"> $11 \times 6 = 66$ 66×45 	Up to 2m	<p>Do not accept sight of a correct multiplication only, e.g. $11 \times 6 \times 45$, for ONE mark.</p> <p>Misreads are not allowed.</p>

Qu.	Requirement	Mark	Additional guidance								
12	The triangle has moved <input type="text" value="6"/> squares to the right and <input type="text" value="5"/> squares down.	1m									
13	Award TWO marks for the correct answer of 15 If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g. <ul style="list-style-type: none"> $4.5 \times 3 = 13.5$ $13.5 - 6 = 7.5$ 7.5×2 	Up to 2m	Answer need not be obtained for the award of ONE mark. Misreads are not allowed.								
14a	3,600	1m	Misreads and transcription errors are not allowed.								
14b	1,440	1m									
15	Award TWO marks for three boxes completed correctly as shown: <table border="1"> <thead> <tr> <th></th> <th>Rounded to nearest hundred</th> </tr> </thead> <tbody> <tr> <td>20,906</td> <td>20,900</td> </tr> <tr> <td>2,090.6</td> <td>2,100</td> </tr> <tr> <td>209.06</td> <td>200</td> </tr> </tbody> </table> If the answer is incorrect, award ONE mark for two boxes correct.		Rounded to nearest hundred	20,906	20,900	2,090.6	2,100	209.06	200	Up to 2m	
	Rounded to nearest hundred										
20,906	20,900										
2,090.6	2,100										
209.06	200										
16	Award TWO marks for the correct answer of 3 If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g. <ul style="list-style-type: none"> $2.5 \times 6 = 15$ $15 \div 5$ 	Up to 2m	Answer need not be obtained for the award of ONE mark. Misreads are not allowed.								
17	A	1m	Accept alternative unambiguous positive indications of the correct triangle, e.g. $2\frac{1}{2}$ or 2.5								

Qu.	Requirement	Mark	Additional guidance
18	<p>Award TWO marks for both kite AND square ticked as shown.</p>  <p>If the answer is incorrect, award ONE mark for:</p> <ul style="list-style-type: none"> kite AND square and not more than one incorrect shape ticked <p>OR</p> <ul style="list-style-type: none"> one correct shape only ticked. 	Up to 2m	Accept alternative unambiguous positive indications, e.g. shapes circled.
19	<p>Numbers circled as shown:</p> <p>200 2,000 5,000 50,000</p>	1m	Accept alternative unambiguous positive indications, e.g. numbers ticked or underlined.
20	<p>Award TWO marks for the correct answer of £11.40</p> <p>If the answer is incorrect, award ONE mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> $£1.25 + £1.60 = £2.85$ $£2.85 \times 4$ 	Up to 2m	<p>Accept for ONE mark an answer of £1,140 OR £1,140p OR £11.4 as evidence of an appropriate method.</p> <p>Answer need not be obtained for the award of ONE mark.</p>
21	<p>An explanation that shows that 5,868 can be made by adding 326 to 17×326, e.g.</p> <ul style="list-style-type: none"> '$5542 + 326 = 18 \times 326$' '$18 \times 326$ is 326 more than 5,542' 'Because this is the same as $17 \times 326 = 5542$ so add one more 326 to get the answer' 'You add 326 to 5,542 and your answer will be correct' 'Because you can add 326 to the answer of 17×326' '$5542 + 326$'. 	1m	<p>Do not accept an explanation that simply calculates $326 \times 18 = 5,868$</p> <p>Do not accept vague or incomplete, or incorrect explanations, e.g.</p> <ul style="list-style-type: none"> 'You could add another 326' 'The difference between 17 and 18 is 1 so you add 326 and that is one more' 'Because if you turn the question around you would see that $17 \times 326 = 5542$ so all you need to do is times the number one more time' '$5,542 + 326$ because it is one more'. $5868 - 326 = 5542$