5.5. ***Units are required in part (b).***

(a) $AC^2 = 30^2 + 24^2 - 2\times 30\times 24\times \cos 35^\circ$ ***(M1)(A1)***

Note: Award ***(M1)*** for substituted cosine rule formula, ***(A1)*** for correct substitutions.

$AC = 17.2$ cm $(17.2168\ldots)$ ***(A1)(G2)*** ***[3 marks]***

Notes: Use of radians gives 52.7002… Award ***(M1)(A1)(A0)***.
No marks awarded in this part of the question where candidates assume that angle $ACB = 90^\circ$.

(b) Area of triangle $ABC = \frac{1}{2}\times 24\times 30\times \sin 35^\circ$ ***(M1)(A1)***

Notes: Award ***(M1)*** for substitution into area formula, ***(A1)*** for correct substitutions.
Special Case: Where a candidate has assumed that angle $ACB = 90^\circ$ in part (a), award ***(M1)(A1)*** for a correct alternative substituted formula for the area of the triangle $\left(ie\ \frac{1}{2}\times \text{base}\times \text{height}\right)$.

$= 206\ \text{cm}^2$ $(206.487\ldots \text{cm}^2)$ ***(A1)(G2)*** ***[3 marks]***

Notes: Use of radians gives negative answer, –154.145… Award (***M1)(A1)(A0)***.
Special Case: Award ***(A1)*****(ft)** where the candidate has arrived at an area which is correct to the standard rounding rules from their lengths (units required).

(c) $206.487...\times 25\times 2600$ ***(M1)***

Note: Award ***(M1)*** for multiplication of their answer to part (b) by 25 and 2600.

$13\,421\,688.61$ ***(A1)***

Note: Accept unrounded answer of $13\,390\,000$ for use of 206.

$13\,400\,000$ ***(AG)*** ***[2 marks]***

Note: The final ***(A1)*** cannot be awarded unless both the unrounded and rounded answers are seen.

continued...

Question 5.5 continued

(d) 1.34×10^{7} ***(A2)*** ***[2 marks]***

Notes: Award ***(A2)*** for the correct answer.
Award ***(A1)(A0)*** for 1.34 and an incorrect index value.
Award ***(A0)(A0)*** for any other combination (including answers such as 13.4×10^{6}).

(e) $2\times206.487\ldots+24\times25+30\times25+17.2168\ldots\times25$ ***(M1)(M1)***

Note: Award ***(M1)*** for multiplication of their answer to part (b) by 2 for area of two triangular ends, ***(M1)*** for three correct rectangle areas using 24, 30 and their 17.2.

2193.26… ***(A1)***

Note: Accept 2192 for use of 3 sf answers.

2190 ***(AG)*** ***[3 marks]***

Note: The final ***(A1)*** cannot be awarded unless both the unrounded and rounded answers are seen.

(f) $\dfrac{2190\times2600}{22\times10000}$ ***(M1)(M1)***

Notes: Award ***(M1)*** for multiplication by 2600 and division by 22, ***(M1)*** for division by 10000.
The use of 22 may be implied *ie* division by 2200 would be acceptable.

25.9 litres (25.8818…) ***(A1)(G2)*** ***[3 marks]***

Note: Accept 26.

Total: [16 marks]