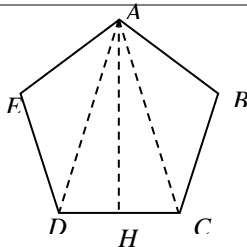


| | | | | |
|----|---|-------------------|--|--|
| 21 | eg. $\frac{3}{9} \times \frac{2}{8} \times \frac{1}{7} \left(= \frac{6}{504} = \frac{1}{84} \right)$ | | 5 | M1 (probabilities from selecting 2, 2, 2) allow $\frac{3}{9} \times \frac{2}{9} \times \frac{1}{9} \left(= \frac{6}{729} \right)$ or $\frac{3}{9} \times \frac{3}{9} \times \frac{3}{9} \left(= \frac{27}{729} \right)$ |
| | eg. $\frac{2}{9} \times \frac{3}{8} \times \frac{4}{7} \left(= \frac{24}{504} = \frac{1}{21} \right)$ | | | M1 (probabilities from selecting 1, 2, 3) allow $\frac{2}{9} \times \frac{3}{9} \times \frac{4}{9} \left(= \frac{24}{729} \right)$ |
| | $6 \times \frac{24}{504} \left(= \frac{144}{504} = \frac{6}{21} = \frac{2}{7} \right)$ | | M1 (probabilities for all combinations of 1, 2, 3) allow $6 \times \frac{24}{729} \left(= \frac{144}{729} \right)$ | |
| | $6 \times \frac{2}{9} \times \frac{3}{8} \times \frac{4}{7} + \frac{3}{9} \times \frac{2}{8} \times \frac{1}{7} \left(= \frac{6}{21} + \frac{1}{84} \right)$ | | M1 complete correct method | |
| | | $\frac{150}{504}$ | A1 oe eg. $\frac{25}{84}$, 0.298, 0.297619... (NB. An answer of $\frac{150}{729} \left(= \frac{50}{243} \right)$ or $\frac{171}{729} \left(= \frac{19}{81} \right)$ scores M1M1M1M0A0) | |
| | | | | Total 5 marks |

| | | | | |
|----|--|---|---------------------------------------|---|
| 22 | $12^2 + 8^2 - 2 \times 12 \times 8 \times \cos(105) (=257\dots)$ | | | M1 |
| | $257(\dots)$ or $\sqrt{257}(=16.05\dots)$ | | | A1 for 257 or awrt 258 or 16 - 16.1 If M1 has been awarded then allow the use of the candidate's value for AD in all subsequent working |
| | eg.  | | | M1 (dep on first M1) complete method to find height of pentagon or any angle within triangle ADC E.g. angle $ADC =$ angle $ACD = 66.08\dots$ angle $DAC = 47.8\dots$ angle $DAH =$ angle $CAH = 23.9\dots$ (accept all these angles rounded or truncated to 3 or more sig figs) |
| | $(AH =) \sqrt{16.05\dots^2 - 6.5^2} (=14.6\dots)$ or $(ADC =) \cos^{-1} \left(\frac{16.05\dots^2 + 13^2 - 16.05\dots^2}{2 \times 16.05\dots \times 13} \right) (=66.08\dots)$ | | | M1 any one relevant area (any calculated values used must come from a correct method) |
| | eg. $0.5 \times 12 \times 8 \times \sin(105) (=46.3\dots)$ or $12 \times 8 \times \sin(105) (=92.7\dots)$ or $0.5 \times 13 \times 14.6 (=95.4\dots)$ or $0.5 \times 13 \times 16.05 \times \sin(66.1)$ eg. $2 \times 0.5 \times 12 \times 8 \times \sin(105) + 0.5 \times 13 \times 14.6$ or $2 \times 0.5 \times 12 \times 8 \times \sin(105) + 0.5 \times 13 \times 16.05 \times \sin(66.1)$ | | | M1 (dep on first M1) complete correct method |
| | 188 | 6 | A1 accept answer in range 188 – 188.5 | |
| | | | | Total 6 marks |

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