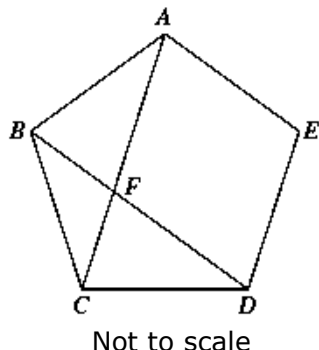
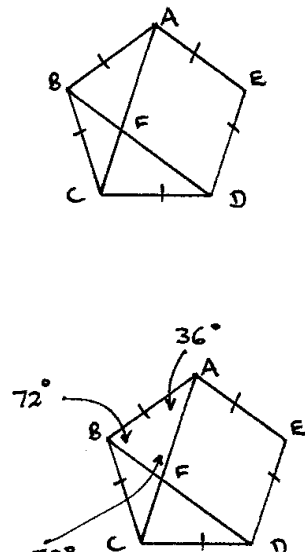


07	5a	<p>In the diagram, $ABCDE$ is a regular pentagon. The diagonals AC and BD intersect at F. Copy or trace this diagram into your writing booklet.</p> <p>(i) Show that the size of $\angle ABC$ is 108°.</p> <p>(ii) Find the size of $\angle BAC$. Give reasons for your answer.</p> <p>(iii) By considering the sizes of angles, show that $\triangle ABF$ is isosceles.</p>	 <p>Not to scale</p>	<p>1</p> <p>2</p> <p>2</p>
<p>i. Angle sum of pentagon $= 180^\circ \times 3$ $= 540^\circ$ Size of each angle in regular pentagon $= 540^\circ \div 5$ $= 108^\circ$ $\therefore \angle ABC = 108^\circ$.</p> <p>ii. $\triangle ABC$ is isosceles triangle $\therefore \angle BAC + \angle BCA = 180^\circ - 108^\circ$ (\angle sum of Δ) $= 72^\circ$ $\therefore \angle BAC = 36^\circ$ (base \angles of isos Δ equal)</p> <p>iii. Similarly, $\angle CBD = 36^\circ$ and $\angle ABC = 108^\circ$ (from i) $\therefore \angle ABF = 108^\circ - 36^\circ$ (\angle sum of Δ) $= 72^\circ$ $\therefore \angle AFB = 180^\circ - (108^\circ + 36^\circ)$ $= 72^\circ$ As $\angle AFB = \angle ABF$, $\triangle ABF$ is isosceles. (base \angles of isos Δ equal)</p>				

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

(i) Better responses either found that the internal angle sum was 540° and then divided by 5, (this was the most successful method), or found that each exterior angle was 72° then took this away from 180° .

(ii) and (iii) Supplying reasons was the important factor in gaining full marks. Marks were also able to be awarded to responses where the written work was made clear by information added to a diagram in the answer booklet. Marks could not be awarded to responses that were not clear and where information may have been added to the diagram on the question paper. An example of this was when an 'x' appeared in the response, but the angle to which it referred was not identified. Full marks could not be awarded where responses did not give reasons, eg writing that $AE \parallel FD$ needed to be supported with the reasons why this is true.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/