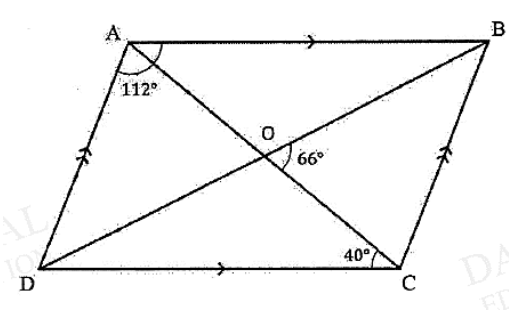
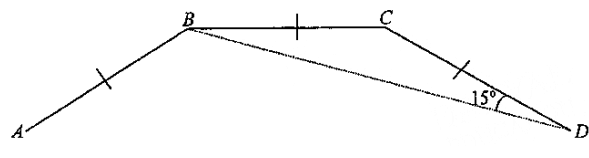
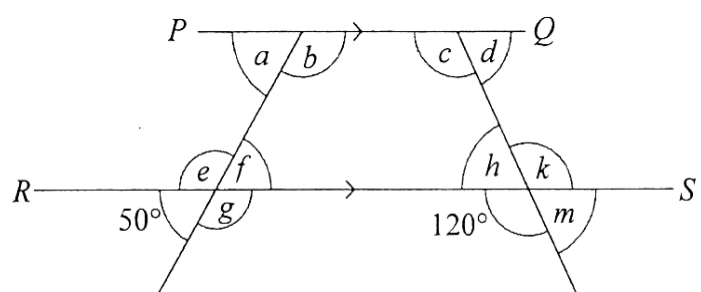
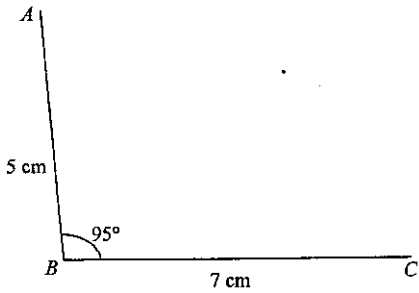


# 6 MUST KNOW QUESTIONS TO CONQUER POLYGONS & GEOMETRICAL CONSTRUCTIONS

1	<p>The diagram shows a parallelogram <math>ABCD</math>. Angle <math>DAB = 112^\circ</math>, angle <math>ACD = 40^\circ</math> and angle <math>BOC = 66^\circ</math>.</p> <div style="text-align: center;">  </div> <p>Giving your reasons, find</p> <p>(a) angle <math>DAC</math>,</p> <p>(b) angle <math>ADC</math>.</p>	<p>[2] [1]</p>
2	<p>The diagram below shows part of a regular <math>n</math>-sided polygon, <math>ABCD</math>. It is given that <math>\angle BDC = 15^\circ</math>.</p> <div style="text-align: center;">  </div> <p>(a) Find the exterior angle of the regular polygon.</p> <p>(b) Calculate the number of sides that the polygon has.</p>	<p>[1] [1]</p>
3	<p>In the diagram, <math>PQ</math> is parallel to <math>RS</math>.</p> <div style="text-align: center;">  </div> <p>Calculate the sum of the angles <math>b</math> and <math>c</math>. Write your reasons clearly.</p>	<p>[4]</p>

4	Cindy is drawing a triangle. The first angle is $x^\circ$ . The second angle is $5^\circ$ more than the first angle. The third angle is three times the size of the second angle. Form an equation and solve it to find the size of the third angle.	[3]
5	<p>The quadrilateral <math>ABCD</math> is such that <math>AB = 5</math> cm, <math>BC = CD = 7</math> cm, <math>AD = 8</math> cm and <math>\angle ABC = 95^\circ</math>. <math>AB</math> and <math>BC</math> are drawn below.</p> <p>(a) Complete the quadrilateral. [1]                  (b) Construct the perpendicular bisector of line <math>BC</math>. [2]                  (c) Construct the angle bisector of <math>\angle BCD</math>. [2]</p> <div style="text-align: center;">  </div> <p>(d) Measure <math>\angle BCD</math>. [2]                  (e) Mark the point <math>X</math> where the two bisectors in (b) and (c) meet. [1]                  (f) Measure and write down the length of <math>CX</math>. [2]</p>	[1] [2] [2] [1] [2]
6	<p><math>ABC</math> is a triangle where <math>AB = 6</math> cm, and <math>\angle BAC = 65^\circ</math> and <math>AC = 9</math> cm.</p> <p>(a) Construct triangle <math>ABC</math>. [2]                  (b) Measure the length of <math>BC</math>. [1]                  (c) Construct the                      (i) perpendicular bisector of <math>BC</math>, [1]                      (ii) angle bisector of <math>\angle BAC</math> [1]                  (d) The perpendicular bisector of <math>BC</math> and the angle bisector of <math>\angle BAC</math> intersect at <math>X</math>. Mark the point <math>X</math>. [1]</p>	[2] [1] [1] [1] [1]

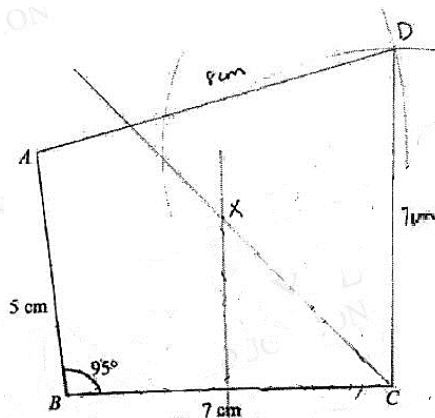
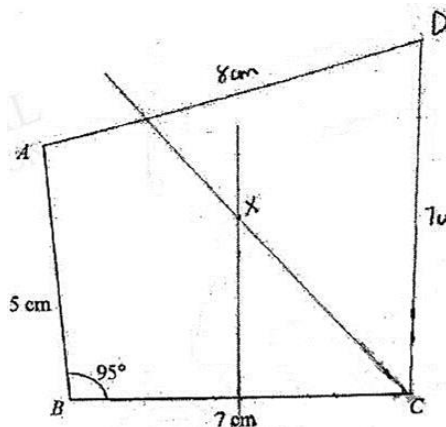
**Answer Key**

1	<p>Solutions:</p> <p>(a) <math>\angle BAC = 40</math> (<i>alt. <math>\angle</math>s, <math>AB \parallel DC</math></i>)  <math>\angle DAC = 112 - 40</math>  <math>= 72^\circ</math></p> <p>(b) <math>\angle ADC = 180 - 72 - 40</math> (<math>\angle</math>s sum of <math>\Delta</math>)  <math>= 68^\circ</math></p> <p>Ans: (a) <math>72^\circ</math> (b) <math>68^\circ</math></p>
2	<p>Solutions:</p> <p>(a) <math>\angle EAC = 180^\circ - 15^\circ - 15^\circ = 150^\circ</math>                      Exterior <math>\angle = 30^\circ</math></p> <p>(b) No. of sides = <math>360 \div 30 = 12</math></p> <p>Ans: (a) <math>30^\circ</math> (b) 12</p>
3	<p>Solution:</p> <p><math>f = 50^\circ</math> (vertically opposite angles)  <math>b = 180^\circ - 50^\circ = 130^\circ</math> (interior angles)  <math>c = 120^\circ</math> (corresponding angles)  <math>b + c = 130^\circ + 120^\circ = 250^\circ</math></p> <p>Ans: <math>250^\circ</math></p>
4	<p>Solution:</p> <p>Let <math>x</math> be the first angle.                      Second angle = <math>x + 5</math>.                      Third angle = <math>3(x + 5)</math>  <math>x + x + 5 + 3(x + 5) = 180</math>  <math>x + x + 5 + 3x + 15 = 180</math>  <math>x = \frac{180-20}{5}</math>  <math>= 32^\circ</math>  <math>3(x + 5) = 111^\circ</math></p> <p>Ans: <math>111^\circ</math></p>

5 Ans:

Appendix 1 ( $BC = 7\text{ cm}$ )

Appendix 2 ( $BC = 7.1\text{ cm}$ )



- (a) See Appendix 1 and 2
- (b) Perpendicular bisector correctly constructed
- (c) Angle bisector correctly constructed
- (d)  $\angle BCD = 93^\circ$ , for  $BC = 7\text{ cm}$   
 $\angle BCD = 91^\circ$ , for  $BC = 7.1\text{ cm}$
- (e) Point X marked.
- (f)  $CX = 5.0\text{ cm}$  ( $\pm 0.2$ ), for  $BC = 7\text{ cm}$   
 $CX = 5.1\text{ cm}$  ( $\pm 0.2$ ), for  $BC = 7.1\text{ cm}$

6 Ans:

(b)  $BC = 8.5$  ( $\pm 0.1$ )

