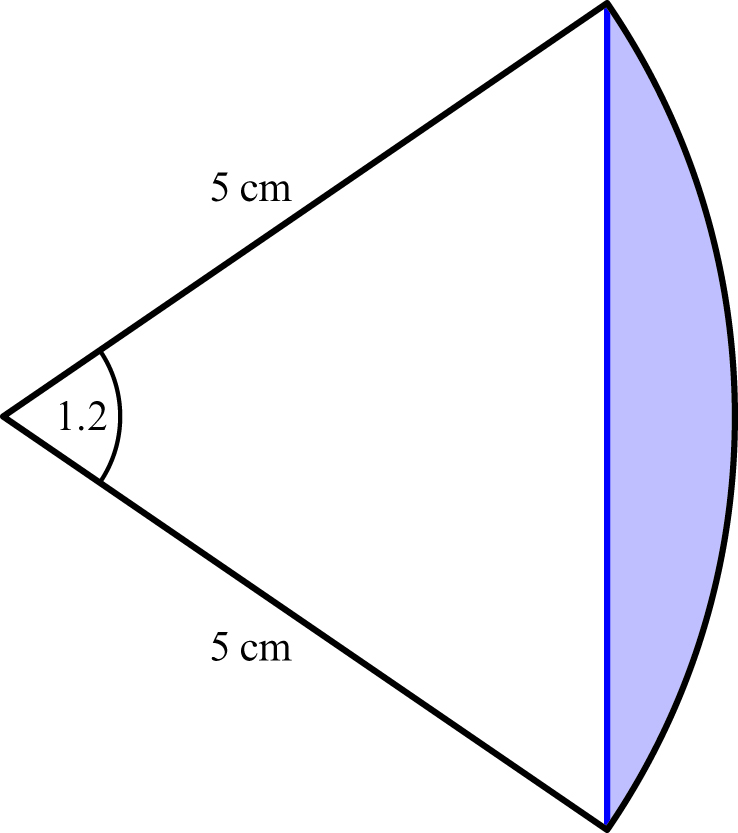
# **Revision: Geometry (Topics 3 & 4)**

**Coursebook chapters: 8–11**

**1.** Find the area of the shaded region.



*(accessible to students on the path to grade 3 or 4) [4 marks]*

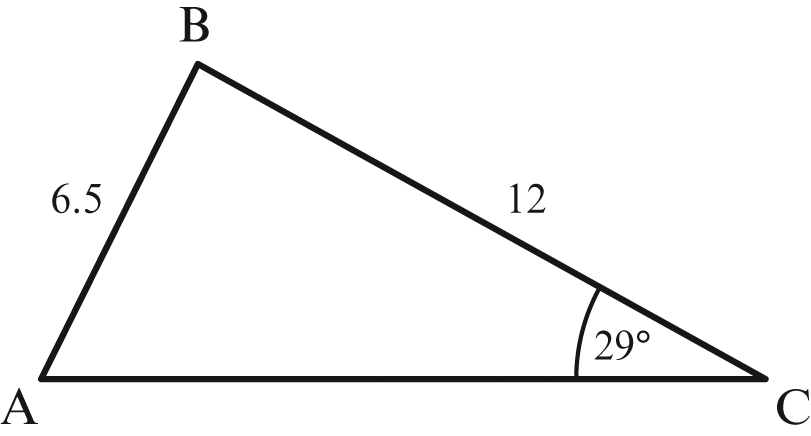
**2.** **Do not use a calculator to answer this question.**

Find the exact solutions of the equation sin 2*θ* = cos 2*θ* for 0 ≤ θ ≤ 180°.

*(accessible to students on the path to grade 3 or 4) [5 marks]*

**3.** Find the angles of the triangle with vertices A(4, 6, 2), B(1, 1, 2) and C(0, −1, 3). Give your answers correct to the nearest degree.

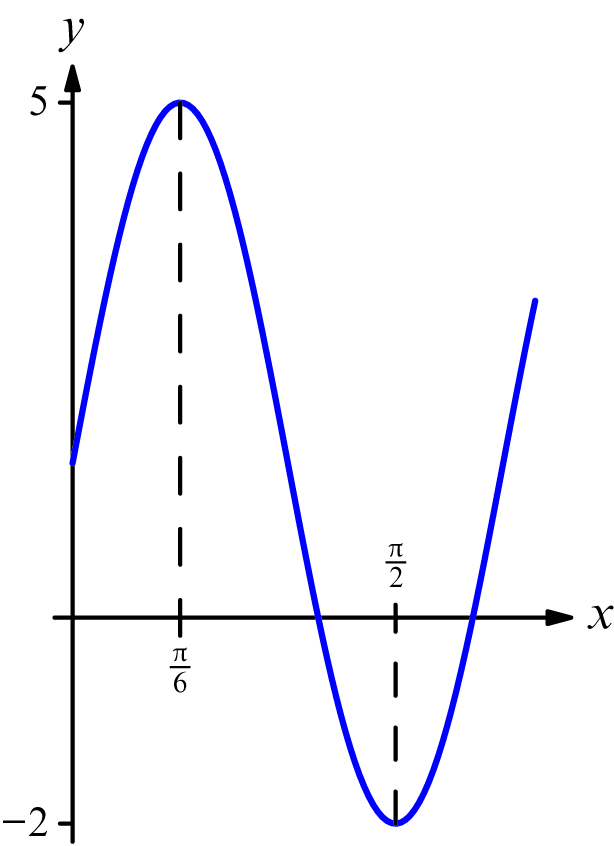
*(accessible to students on the path to grade 3 or 4) [9 marks]*

**4.** In triangle ABC, AB = 6.5 cm, BC = 12 cm and  = 29°.

Find the two possible values of.  
 *(accessible to students on the path to grade 5 or 6) [5 marks]*

**5.** **Do not use a calculator to answer this question.**

The graph of the function *f*(*x*) = *A* sin(*kx*) + *B* is shown below.



Find the values of *k*, *A* and *B*.

*(accessible to students on the path to grade 3 or 4) [5 marks]*

**6. Do not use a calculator to answer this question.**

Solve the equation cos(2*x* + 30°) =  for 0° ≤ *x* ≤ 360°.

*(accessible to students on the path to grade 5 or 6) [5 marks]*

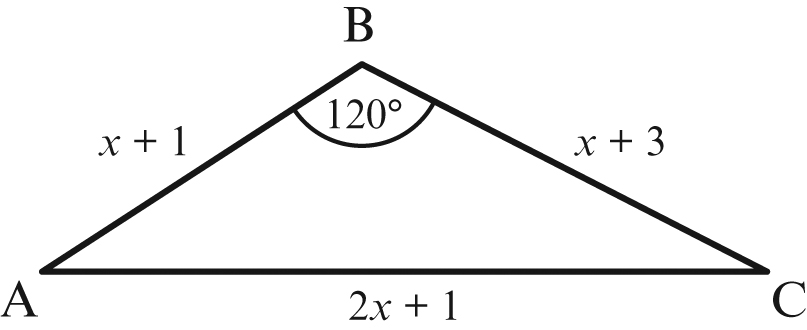
**7.** **Do not use a calculator to answer this question.**

(a) Given that cos 2*x* – 3 sin *x* + 1 = 0, show that 2 sin2 *x* + 3 sin *x* – 2 = 0.

(b) Hence solve the equation cos 2*x* – 3 sin *x* + 1 = 0 for *x* = ∈ [0, 2*π*].

*(accessible to students on the path to grade 5 or 6) [7 marks]*

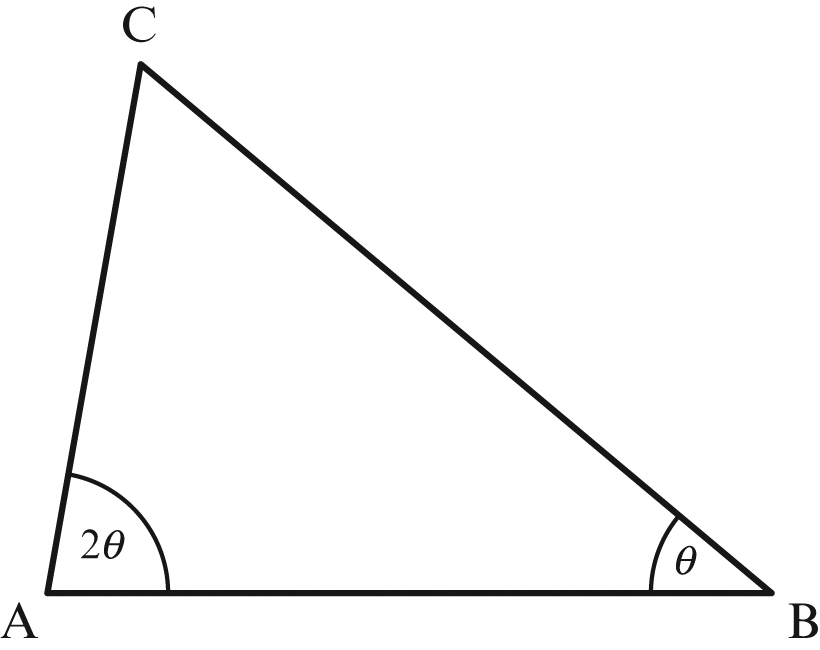
**8.** The triangle in the diagram has sides AB = *x* + 1, BC = *x* + 3, and CA = 2*x* + 1 and angle  = 120°.



Find the value of *x*.

*(accessible to students on the path to grade 5 or 6) [6 marks]*

**9.** Triangle ABC has  = 2*θ*,  = *θ* and BC : AC = 5 : 4.



(a) Find the exact value of cos *𝜃*

(b) Hence find the angles of the triangle.

*(accessible to students on the path to grade 7) [9 marks]*

**10.** Line l1 has equation ***r*** = (6***i*** − 7***j*** − 7***k***) + *s*(2***i*** + 5***j*** + 3***k***). Line l2 passes through the origin and the point B(4, −1, −2). The two lines intersect at point A.

(a) Write down a vector equation of l2.

*(accessible to students on the path to grade 3 or 4)*

(b) Find the coordinates of A.

*(accessible to students on the path to grade 5 or 6)*

(c) Find the angle between l1 and l2.

*(accessible to students on the path to grade 3 or 4)*

(d) Find the distance AB, and hence find the perpendicular distance from B to l1.

*(accessible to students on the path to grade 7)*

*[12 marks]*

**11. Do not use a calculator to answer this question.**

Given that *θ* ∈  and that vectors  and  are perpendicular,

(a) Show that tan 2*θ* = 2.

(b) Hence find the exact value of tan *θ*.

*(accessible to students on the path to grade 7) [9 marks]*