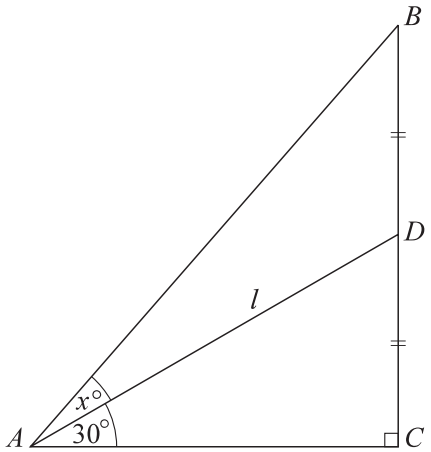
6



In the diagram, triangle ABC is right-angled and D is the mid-point of BC. Angle $DAC = 30^\circ$ and angle $BAD = x^\circ$. Denoting the length of AD by l,

(i) express each of AC and BC exactly in terms of l, and show that $AB = \frac{1}{2}l\sqrt{7}$, [4]

(ii) show that $x = \tan^{-1}\left(\frac{2}{\sqrt{3}}\right) - 30$. [2]