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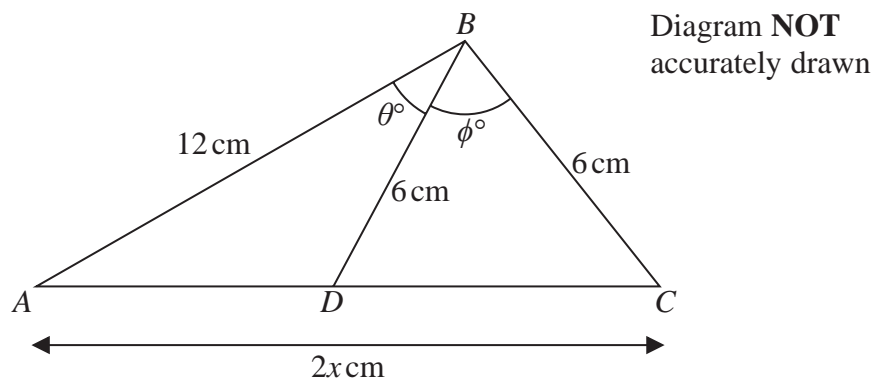


Figure 3

Figure 3 shows triangle ABC with $AB = 12$ cm, $BC = 6$ cm and $AC = 2x$ cm.

The point D is the midpoint of AC and $BD = 6$ cm.

$\angle ABD = \theta^\circ$ and $\angle DBC = \phi^\circ$ where $\theta \neq 0$ and $\phi \neq 0$

(a) Show that $\cos ADB = \frac{x^2 - 108}{12x}$ (2)

(b) Hence, or otherwise, show that $AC = 6\sqrt{6}$ cm. (4)

(c) Show that $\sin(\theta^\circ + \phi^\circ) = \sin \phi^\circ$ (4)

(d) Hence show that $\theta = 180 - 2\phi$ (2)



Question 9 continued

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Question 9 continued

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(Total for Question 5 is 12 marks)

