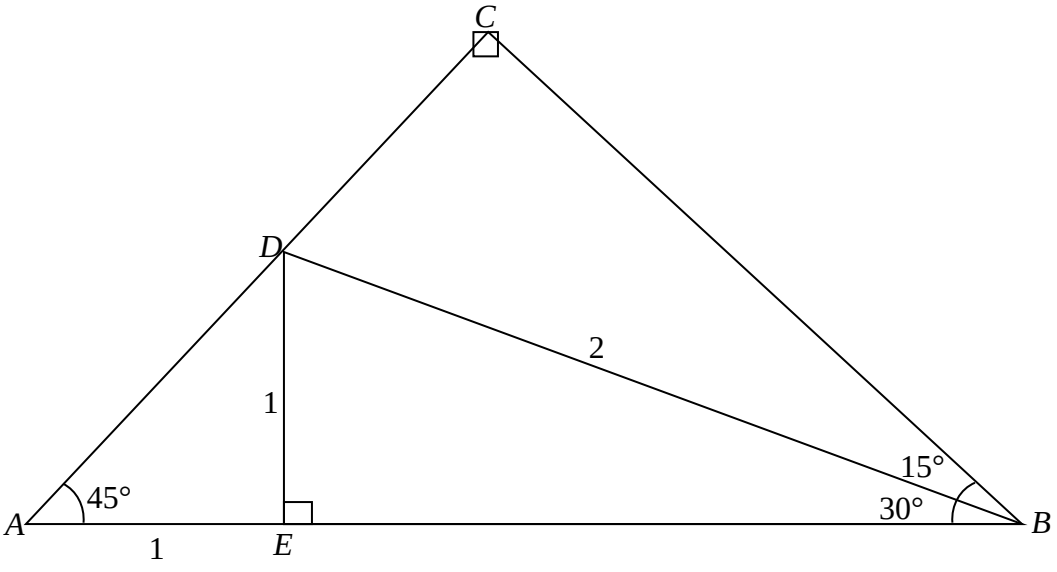
8 **In this question you must show detailed reasoning.**

The diagram shows triangle *ABC*.



The angles *CAB* and *ABC* are each 45°, and angle $ACB = 90^\circ$.
The points *D* and *E* lie on *AC* and *AB* respectively. $AE = DE = 1$, $DB = 2$.
Angle $BED = 90^\circ$, angle $EBD = 30^\circ$ and angle $DBC = 15^\circ$.

(a) Show that $BC = \dfrac{\sqrt{2}+\sqrt{6}}{2}$. **[3]**

(b) By considering triangle *BCD*, show that $\sin 15^\circ = \dfrac{\sqrt{6}-\sqrt{2}}{4}$. **[3]**