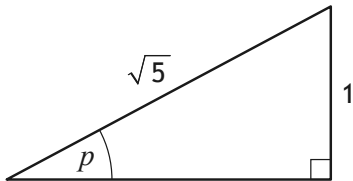**6.** The right-angled triangle in the diagram is such that $\sin p = \dfrac{1}{\sqrt{5}}$ and $0 < p < \dfrac{\pi}{4}$.



(a) Determine the value of:

   (i) $\sin 2p$                                                         **3**

   (ii) $\cos 2p$.                                                          **1**

(b) Hence determine the value of $\sin 4p$.                           **1**