

9

It is given that $\cos 15^\circ = \frac{1}{2}\sqrt{2 + \sqrt{3}}$ and $\sin 15^\circ = \frac{1}{2}\sqrt{2 - \sqrt{3}}$

Show that $\tan^2 15^\circ$ can be written in the form $a + b\sqrt{3}$, where a and b are integers.

Fully justify your answer.

[3 marks]