

- 11** A student is attempting to prove that $\sqrt{5}$ is irrational.
The first three lines of their proof are shown below.

Assume that $\sqrt{5}$ is rational, so it can be written as $\sqrt{5} = \frac{a}{b}$. **Line 1**

Squaring both sides gives $5 = \frac{a^2}{b^2}$. Hence $a^2 = 5b^2$. **Line 2**

Hence a must be a multiple of 5, so $a = 5k$, for some integer k . **Line 3**

- (a) State any conditions required on **Line 1**. [2]
- (b) Explain why **Line 2** means that a must be a multiple of 5. [2]
- (c) Complete the proof to show that $\sqrt{5}$ is irrational. [3]