The equation connecting object distance u, image distance v and focal length f for a lens is

$$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}.$$

A student measures values of u and v, with their associated uncertainties. These are

$$u = 50\,\text{mm} \pm 3\,\text{mm},$$

$$v = 200\,\text{mm} \pm 5\,\text{mm}.$$

He calculates the value of f as 40 mm.

What is the uncertainty in this value?

A   ±2.1 mm   **B**   ±3.4 mm   **C**   ±4.5 mm   **D**   ±6.8 mm