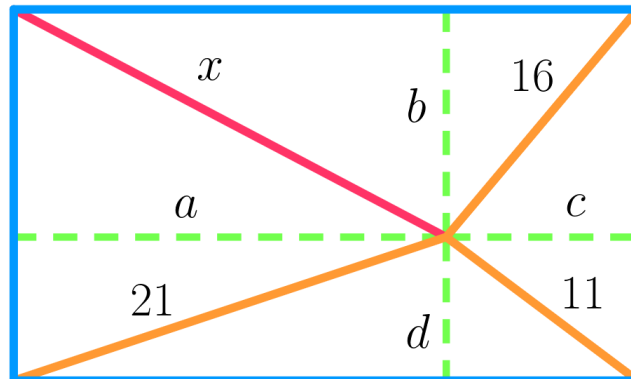# Vexing Vexillology: Solution

The Pythagorean theorem yields the system of equations

$$\begin{cases} a^2 + b^2 = x^2 \\ b^2 + c^2 = 16^2 \\ c^2 + d^2 = 11^2 \\ d^2 + a^2 = 21^2 \end{cases}$$

which yields

$$a^2 + b^2 + c^2 + d^2 \;=\; x^2 + 11^2 \;=\; 16^2 + 21^2$$

and therefore

$$x = \sqrt{16^2 + 21^2 - 11^2} = 24.$$

This is an example of the **British Flag Theorem**.