YOU & MATHS **Substitute and explain** Use substitution to solve the two following systems, and explain your solutions.

a. $\begin{cases} x + 2y = 3 \\ 2x + 4y = 6 \end{cases}$

b. $\begin{cases} x + 2y = 3 \\ 2x + 4y = 7 \end{cases}$

a. You could proceed as follows:

$$\begin{cases} x + 2y = 3 \\ 2x + 4y = 6 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 2(3 - 2y) + 4y = 6 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 6 - 4y + 4y = 6 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 6 = 6 \end{cases}.$$

So the system is consistent and dependent.

b. For the second system, using substitution, you could proceed like this:

$$\begin{cases} x + 2y = 3 \\ 2x + 4y = 7 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 2(3 - 2y) + 4y = 7 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 6 - 4y + 4y = 7 \end{cases} \rightarrow \begin{cases} x = 3 - 2y \\ 6 = 7 \end{cases}.$$

So the system is inconsistent.