Basic Mathematics - Quiz 11
Solution

Solve the following system of equations (justify by writting intermediate steps) :

$$\begin{cases} x + 4y = 4 \\ 7x - 2y = 11 \end{cases}$$

We can work by substitution, using the first equation. The system is equivalent to

$$\begin{cases} x = 4 - 4y \\ 7x - 2y = 11 \end{cases}$$

so it is equivalent to

$$\begin{cases} x = 4 - 4y \\ 7(4 - 4y) - 2y = 11 \end{cases}$$

and by simplifying the second row, it is equivalent to

$$\begin{cases} x = 4 - 4y \\ 28 - 30y = 11 \end{cases}$$

which is equivalent to

$$\begin{cases} x = 4 - 4y \\ y = (28 - 11)/30 = 17/30 \end{cases}$$

and substituting again, the system is equivalent to

$$\begin{cases} x = 4 - 4 \times 17/30 = (60 - 34)/15 = 26/15 \\ y = 17/30 \end{cases}$$

so the unique solution of the system of equations is $x = 26/15$ and $y = 17/30$.