

$$\begin{aligned} 6x + 3y &= 18 \\ 2x + 5y &= 14 \end{aligned}$$

Example from Book p. 324
using elimination method
but first transform before eliminate

in order to eliminate one the variables,
then that variable needs to have the
same coefficient in both equations (transform)

$$\begin{array}{l} 6x + 3y = 18 \quad \xrightarrow{\text{don't change}} \quad 6x + 3y = 18 \\ 2x + 5y = 14 \quad \xrightarrow{\text{multiply the whole equation by 3}} \quad 6x + 15y = 42 \end{array}$$

now that x has the same coefficient
in both equations, it can be
eliminated:

let us subtract

$$\begin{array}{r} 6x + 3y = 18 \\ - 6x + 15y = 42 \\ \hline \end{array} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \Leftrightarrow \begin{array}{r} 6x + 3y = 18 \\ -6x - 15y = -42 \\ \hline \end{array}$$

$$\text{add: } 0x - 12y = -24$$

$$-12y = -24 \Rightarrow y = 2$$

now replace y by 2 in any of the two equations

$$\begin{aligned} 6x + 3y &= 18 \\ 6x + 3 \times 2 &= 18 \\ 6x + 6 &= 18 \\ 6x &= 18 - 6 \\ 6x &= 12 \\ x &= 2 \end{aligned}$$

Please Remember:

- you can solve the system in any method that you know.
- you don't have to solve it this way (transform then eliminate)
- in SAT section 4, don't solve it using pencil & paper. USE CALCULATOR!