

# Constructing Linear Equations

Saturday, 12 January 2019 11:02 am

★ By the end of the lesson I would hope that you have an understanding of the concepts below which you can apply to a number of complex questions:

- Know how to construct a linear equation and then go on to solve them.

## RECAP:

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The opening few chapters for this course are designed to recap the very important subject which is Algebra.

Arguably, one of the most complex parts of this whole course (and Methods 3 and 4) is the ability to extract from worded questions the Mathematics you need to then go on and solve.

Worded questions are always considered more difficult. The way to improve is to look for key words in the questions. These will provide the signpost to know how to proceed.

### Example (from the Cambridge Essentials Textbook Series)

A chef uses the following rule for cooking a turkey:

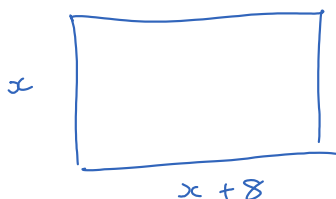
'Allow 30 minutes for each kilogram weight of turkey and then add an extra 15 minutes.'

If the chef forgot to weigh a turkey before cooking it, but knew that it had taken 3 hours to cook, calculate how much it weighed.

$$\begin{aligned}x &= \text{weight} & t &= 30x + 15 \\180 &= 30x + 15 \\165 &= 30x \\x &= \frac{11}{2} \text{ kg} \\&= \underline{\underline{5.5 \text{ kg}}}\end{aligned}$$

### Example (from the Cambridge Essentials Textbook Series)

Find the area of a rectangle whose perimeter is 108 m, if it is 8 cm longer than it is wide.



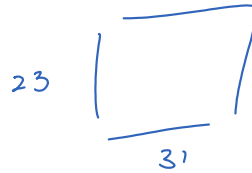
$$P = 108 \text{ m}$$

$$\begin{aligned}x + x + (x + 8) + (x + 8) &= 108 \\4x + 16 &= 108 \\4x &= 92 \\x &= \underline{\underline{23 \text{ cm}}}\end{aligned}$$

$$P = 108 \text{ m}$$

$$= 108 \text{ cm}$$

$$x = \underline{\underline{23 \text{ cm}}}$$



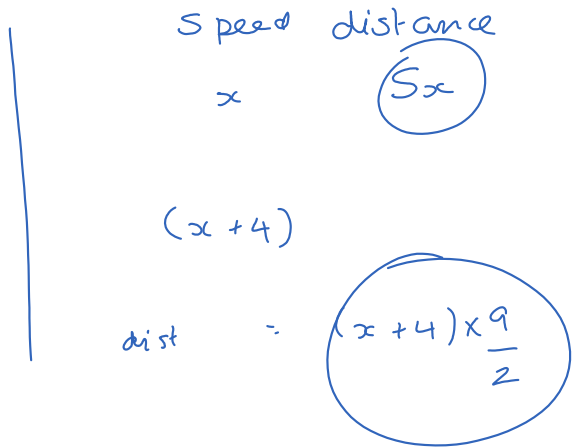
$$\text{Area} = 23 \times 31$$

$$= \underline{\underline{713 \text{ cm}^2}}$$

**Example (from the Cambridge Essentials Textbook Series)**

Adam normally takes 5 hours to travel between Highett and Logett. One day he increases his speed by 4 km/h and finds the journey from Highett to Logett takes half an hour less than the normal time. Find his normal speed.

$$\text{Dist} = \text{Speed} \times \text{time}$$



$$t = \frac{9}{2}$$



$$(x+4) \frac{9}{2} = 5x$$

$$\times 2 \quad (x+4) 9 = 10x$$

$$\cancel{9}x + 36 = 10x$$

$$36 = 10x - 9x$$

$$x = \underline{\underline{36 \text{ km/hr}}}$$