

Worksheet 1.9 Introduction to Algebra

Section 1 ALGEBRAIC EXPRESSIONS

Algebra is a way of writing arithmetic in a general form. You have already come across some algebraic expressions in previous worksheets. An algebraic expression is one in which the arithmetic is written with symbols rather than numbers. The most common use of algebra is in writing formulae. A formula is an algebraic expression which acts as a general 'recipe':

Example 1 :

$$C = 2.54 \times I$$

where I represents the number of inches, and C represents the number of centimetres. This formula represents a recipe for converting a length in inches to one in centimetres. If a ruler, say, is 12 inches long, then we can use the formula to work out how long it is in centimetres. It is $2.54 \times 12 = 30.48\text{cm}$.

Example 2 : You want to buy tickets for a show for 2 adults and 2 children. Let the price for an adult ticket be a (in dollars) and the price for a child c (again in dollars). Then the total cost P is

$$P = a + a + c + c$$

If the adult's tickets are \$55, and the children's tickets are \$30, then we would have

$$\begin{aligned} a &= 55 \\ c &= 30 \end{aligned}$$

so that $P = 55 + 55 + 30 + 30$. But if you realize that $P = 2a + 2c = 2(a + c)$ then you have an easier calculation to do, and it is also easy to substitute in other prices for the tickets.

Here are some algebraic expressions that we have already seen in the worksheets:

1. ab means a multiplied by b
2. $(-a)b = -ab$ means $-a$ multiplied by b
3. $2(x + y)$ means the sum of x and y all multiplied by 2