

Exercise 4H

- To make a sponge cake you need 80 g of flour and 50 g of fat.
To make a fruit cake you need 60 g of flour and 90 g of fat.
Find a model for
 - the amount flour needed to make both cakes
 - the amount of fat needed to make both cakes.Peter has 820 g of flour and 880 g of fat.
 - How many of each type of cake can he make?
- It takes 8 hours to make a table and 3 hours to make a chair.
For a table the wood costs \$100. For a chair the wood costs \$30 for a chair.
A carpenter has 51 hours and \$570.
How many tables and chairs can she make?
- A van carries up to 3 people and 7 cases.
A car carries up to 5 people and 3 cases.
How many vans and cars do you need for 59 people and 70 cases?
- A passenger plane carries 80 passengers and 10 tonnes of supplies.
A transport plane carries 50 passengers and 25 tonnes of supplies.
How many planes of each type do you need to carry 620 people and 190 tonnes of supplies?
- A school mathematics department has 1440 euros to buy textbooks.
Maths for All volume 1 costs 70 euros. *Maths for All* volume 2 costs 40 euros.
The department wants twice as many copies of volume 1 as volume 2.
How many of each volume can they buy?

Extension material on CD:
Worksheet 4 - Equations



4.3 Quadratic models

Quadratic functions and their graphs

→ A **quadratic function** has the form
 $f(x) = ax^2 + bx + c$, where $a, b, c \in \mathbb{R}$ and $a \neq 0$.

Why $a \neq 0$? What kind of function would you get if $a = 0$?

The domain of a quadratic function can be the entire set of real numbers (\mathbb{R}) or any subset of this.

Here are examples of some quadratic functions:

$$\begin{array}{lll} f(x) = x^2 + 3x + 2 & f(x) = x - 3x^2 & f(x) = 3x^2 + 12 \\ (a = 1, b = 3, c = 2) & (a = -3, b = 1, c = 0) & (a = 3, b = 0, c = 12) \end{array}$$