Algebra problems

- Express missing number problems algebraically
- Use simple formulae

Challenge 1

Four boys are throwing javelins.

- Tom threw a javelin x metres.
- John threw a javelin half as far as Tom.
- Jim threw a javelin 12 metres further than John.
- Jack's throw was 3 metres less than Tom.

a Write expressions using x for how far John, Jim and Jack threw their javelins.

b If $x = 50$ m, calculate how far each of the boys threw the javelin.

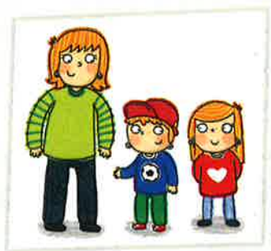
Challenge 2

1 Find the value of x.

a $3x = 2x + 3$ **b** $2x - 4 = x + 3$ **c** $2 + 3x = x + 4$ **d** $6x - 20 = 10 + x$

2 Three families visit a Theme Park. 'c' is the cost of admission for a child and 'a' is the cost of admission to the Theme Park for an adult. Write an expression for the entry cost for each family.

a Andrews family

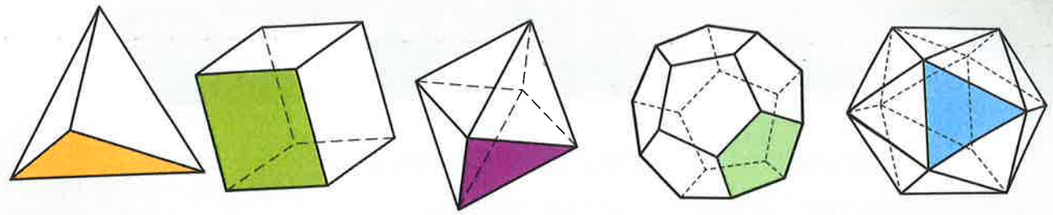


b Barnes family

c Singh family

3 If the cost for a child is £12 and the cost for an adult is £21, calculate the cost for each family and then for your own family.

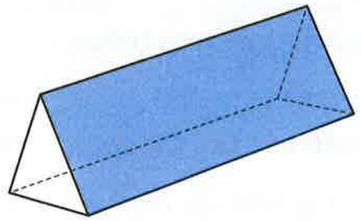
4 These are the five Platonic solids. They are very special because every face is a regular polygon of the same size and shape: that's why we use them as dice.

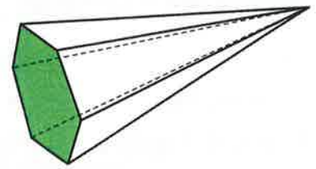


a Draw a table showing the number of faces (F), vertices (V) and edges (E) for the 5 Platonic solids. Add an extra column for 'F + V'.

b Use the information from the table to write an equation relating F, V and E.

c Do the triangular prism and hexagonal pyramid shown below fit the formula? Choose two more 3-D shapes and see if they fit the formula.





Challenge 3

There are three commonly used temperature scales:

- In Britain, the Celsius scale (°C) is generally used.
- In America, the Fahrenheit scale (°F) is generally used.
- Scientists all over the world use the Kelvin scale (K).

Copy the table below and use the formulas in the Rule box to fill in the missing temperatures.

°Fahrenheit	°Celsius	Kelvin
	0°	
140°		
	37°	
212°		

Rule

- To convert from °Fahrenheit to °Celsius: $C = \frac{5}{9}(F - 32)$
- To convert from °Celsius to °Fahrenheit: $F = \frac{9}{5}C + 32$
- To convert from °Celsius to Kelvin: $K = C + 273$