Practice Sheets Answers

Pyramids (mild)

Base shape	Total number of Faces	Number of Vertices
Triangle	4	4
Square	5	5
Pentagon	6	6
Hexagon	7	7
Heptagon	8	8
Octagon	9	9

The number of faces is equivalent to the number of sides of the 2-D non-triangular face, plus 1. This is because a triangular face is attached to each side of the non-triangular face. So, for example, the square-based pyramid has four triangular faces plus the 1 square base. The number of vertices is equivalent to the number of vertices on the 2-D base shape, plus the vertex at the 'top' of the pyramid (the apex).

Challenge

A pyramid with a 10-sided base will have 11 faces and 11 vertices.

Prisms (hot)

'End' shape	Total number of Faces	Number of Vertices
Triangle	5	6
Square	6	8
Pentagon	7	10
Hexagon	8	12
Heptagon	9	14
Octagon	10	16

The number of faces is equivalent to the number of sides of the 2-D shape at each end, plus 2. This is because a rectangular face joins the corresponding sides of the 2-D shapes at each end, so it is the number of those rectangles plus the 2 'end' faces.
The number of vertices is twice the number of sides of the 2-D shape at each end. The vertices of the 3-D shape can be seen as being double the number of vertices of the 2-D shape at each end.

Challenge

A shape with 9-sided 'end' faces has 11 faces and 18 vertices; a shape with 10-sided 'end' faces has 12 faces and 20 vertices; a shape with 100-sided 'end' faces has 102 faces and 200 vertices.

We could make generalisations, using some letters to represent numbers, as follows:

'End' shape	Number of sides on 'end'shape	Total number of Faces	Number of Vertices
e.g. triangle	3	5	6
e.g. square	4	6	8
n-sided polygon	n	n + 2	double n or 2 x n or 2n