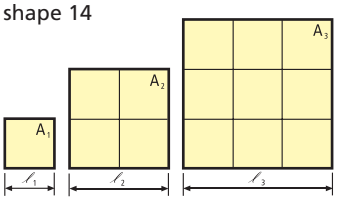
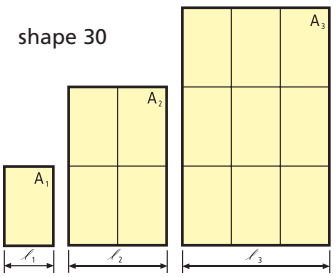
Similar figures and similar solids

The ratio of areas of similar figures

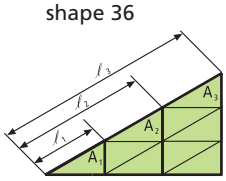
shape 14



shape 30



shape 36

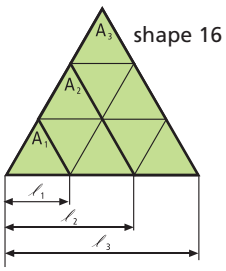


$$\frac{A_1}{A_2} = \frac{1}{4} = \frac{(1)^2}{(2)^2} = \frac{\ell_1^2}{\ell_2^2}$$

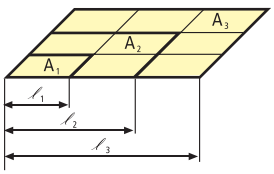
$$\frac{A_1}{A_3} = \frac{1}{9} = \frac{(1)^2}{(3)^2} = \frac{\ell_1^2}{\ell_3^2}$$

If a corresponding dimension is doubled the area is increased 4 times. If trebled, the area is increased 9 times.

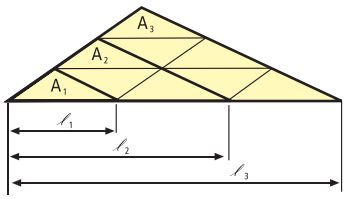
shape 16



shape 40

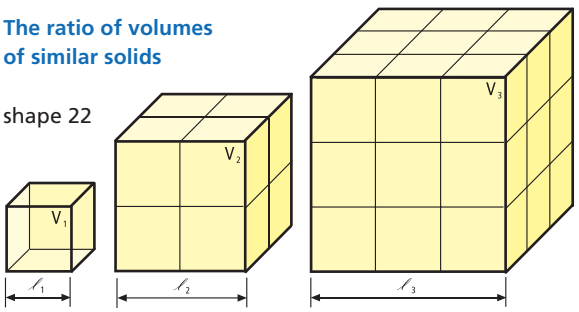


shape 33

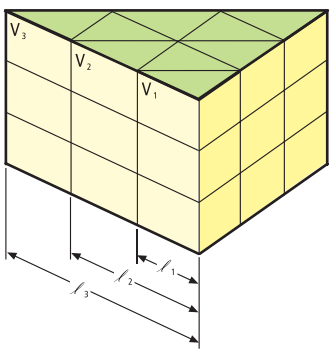


The ratio of volumes of similar solids

shape 22



shape 21



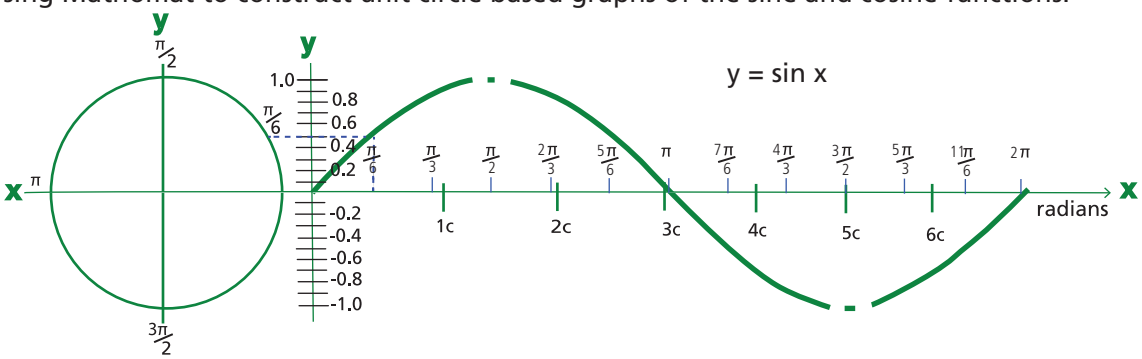
$$\frac{V_1}{V_2} = \frac{1}{8} = \frac{(1)^3}{(2)^3} = \frac{\ell_1^3}{\ell_2^3}$$

$$\frac{V_1}{V_3} = \frac{1}{27} = \frac{(1)^3}{(3)^3} = \frac{\ell_1^3}{\ell_3^3}$$

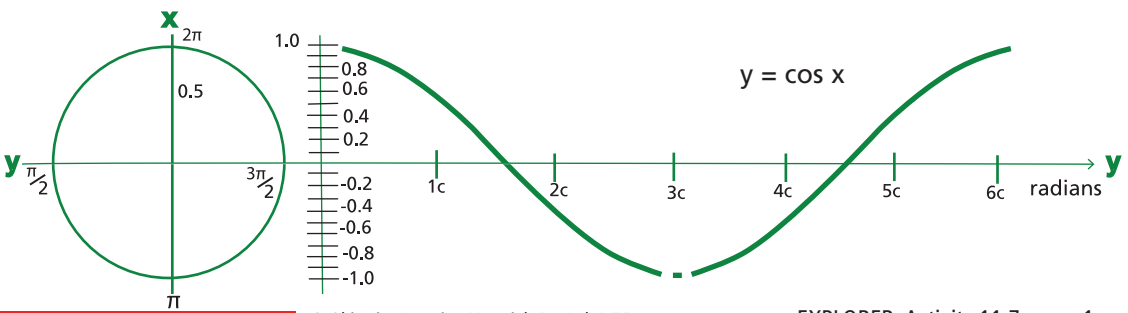
If a corresponding dimension is doubled the volume is increased 8 times. If trebled, the volume is increased 27 times.

The sine and cosine functions

Using Mathomat to construct unit circle based graphs of the sine and cosine functions.



The linear radian scale on the upper edge of the Mathomat template can be used with the sine scale on the lower right edge and with shapes 45 (unit circle) and 46 (sine curve) to represent the graph of y=sine x. Values of sine for various angles can be measured directly from the graph. In this case the sine value of 0.5 for pi/6 is shown. The unit circle is rotated to represent the function y = cos x in the lower graph.



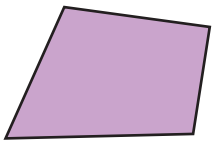
Quadrilateral Families

Understanding Mathomat quadrilaterals, building on the Mathomat families activity.

Use your Mathomat template to draw in an example for each of the members of the quadrilateral family shown below.

Quadrilaterals

- concave
- convex



- **Trapezium**
  one pair of opposite sides parallel
- **Kite**
  Two pairs of adjacent angles equal in length
- **Isosceles trapezium**
  Two pairs of adjacent angles the same
- **Parallelogram**
  Two pairs of opposite sides parallel
- **Rectangle**
  four right angles
- **Rhombus**
  four sides equal
- **Square**
  Four equal sides and four equal angles

Print and use the quadrilaterals family guide from the website for use with this investigation.

More about MATHOMAT