

# Euclid

EU

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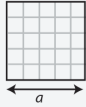
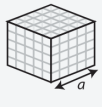
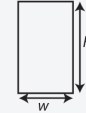
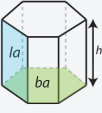

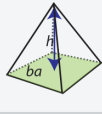

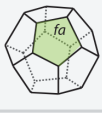


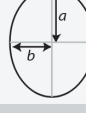
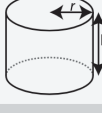
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# 1 Area and Volume of Geometric Object

## 1.1 Table

Two-dimensional plane shapes	Area <i>The measure of how many squares will fit into a shape.</i> <b>Units<sup>2</sup></b>	Three-dimensional solid shapes	Surface Area <i>The measure of the area of all outward facing sides.</i> <b>Units<sup>2</sup></b>	Volume <i>The measure of how many cubes will fit into a shape.</i> <b>Units<sup>3</sup></b>
<b>Square</b> 	Area = $a^2$ or $a \times a$ Example: $a = 5\text{cm}$ Area = $5^2 = 25\text{cm}^2$	<b>Cube</b> 	Surface Area = $6 \times a^2$ Example: $a = 5\text{cm}$ Surface Area = $150\text{cm}^2$	Volume = $a^3$ or $a \times a \times a$ Example: $a = 5\text{cm}$ Volume = $125\text{cm}^3$
<b>Rectangle</b> 	Area = $w \times h$ Example: $w = \text{width} = 10\text{cm}$ $h = \text{height} = 20\text{cm}$ Area = $10 \times 20 = 200\text{cm}^2$	<b>Prism</b> 	Surface Area = $2 \times ba + la$ Example: $ba = \text{base area} = 20\text{cm}^2$ $la = \text{lateral area (all sides)} = 60\text{cm}^2$ Surface area = $2 \times 20 + 60 = 100\text{cm}^2$	Volume = $ba \times h$ Example: $ba = \text{base area} = 20\text{cm}^2$ $h = \text{height} = 5\text{cm}$ Volume = $20 \times 5 = 100\text{cm}^3$
<b>Triangle</b> 	Area = $b \times h \times 0.5$ Example: $b = \text{base} = 20\text{cm}$ $h = \text{vertical height} = 15\text{cm}$ Area = $20 \times 15 \times 0.5 = 150\text{cm}^2$	<b>Pyramid</b> 	Surface Area = $ba + la$ Example: $ba = \text{base area} = 16\text{cm}^2$ $la = \text{lateral area (all sides)} = 60\text{cm}^2$ Surface area = $16 + 60 = 76\text{cm}^2$	Volume = $ba \times h \times 1/3$ Example: $ba = \text{base area} = 16\text{cm}^2$ $h = \text{height} = 9\text{cm}$ Volume = $16 \times 9 \times 1/3 = 48\text{cm}^3$
<b>Reg Polygon</b> 	Area = $n \times s \times a \times 0.5$ Example: $n = \text{number of sides} = 6$ $\text{length of side} = 5\text{cm}$ $a = \text{apothem} = 15\text{cm}$ Area = $6 \times 5 \times 15 \times 0.5 = 225\text{cm}^2$	<b>R. Polyhedron</b> 	Surface Area = $fa \times s$ Example: $fa = \text{area of one side} = 200\text{cm}^2$ $s = \text{number of sides} = 12$ Surface area = $200 \times 12 = 2400\text{cm}^2$	Example: There is no simple generic formula for working out the volume of a regular polyhedron.
<b>Circle</b> 	Area = $\pi \times r^2$ Example: $\pi = \text{pi} = 3.14$ $r = \text{radius} = 5\text{cm}$ Area = $3.14 \times 5^2 = 3.14 \times 5 \times 5 = 78.5\text{cm}^2$	<b>Sphere</b> 	Surface Area = $4 \times \pi \times r^2$ Example: $r = \text{radius} = 4.5\text{cm}$ Surface area = $4 \times 3.14 \times 20.25 = 254.5\text{cm}^2$ (Approx)	Volume = $4/3 \times \pi \times r^3$ Example: $r = \text{radius} = 4.5\text{cm}$ Volume = $4/3 \times 3.14 \times 4.5^3 = 381.5\text{cm}^3$ (Approx)
<b>Ellipse</b> 	Area = $\pi \times a \times b$ Example: $\pi = \text{pi} = 3.14$ $a = \text{radius of long axis} = 6$ $b = \text{radius short axis} = 4$ Area = $3.14 \times 6 \times 4 \times 5 = 75.36\text{cm}^2$	<b>Cylinder</b> 	Surface Area = $2\pi rh + 2\pi r^2$ Example: $r = \text{radius} = 5\text{cm}$ $h = \text{height} = 10\text{cm}$ Surface area = $2 \times 3.14 \times 5 \times 10 + 2 \times 3.14 \times 25 = 471\text{cm}^2$	Volume = $\pi \times r^2 \times h$ Example: $r = \text{radius} = 5\text{cm}$ $h = \text{height} = 10\text{cm}$ Volume = $3.14 \times 25 \times 10 = 785\text{cm}^3$ (Approx)