

Solid Figures Formula Reference

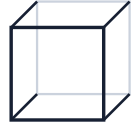
Use the stated assumptions for each formula. Area is measured in square units and volume in cubic units.

Cube

A rectangular prism with six congruent square faces.

Assumption: All edges have length s .

Six congruent square faces.



Surface area: $SA = 6s^2$ (square units)

Volume: $V = s^3$ (cubic units)

s = edge length

Rectangular Prism (Cuboid)

A right prism with rectangular faces.

Assumption: Edges l , w and h meet at right angles.

Opposite faces are congruent.



Surface area: $SA = 2lw + 2lh + 2wh$ (square units)

Volume: $V = lwh$ (cubic units)

l = length; w = width; h = perpendicular height

General Right Prism

A solid with two congruent parallel polygonal bases joined by rectangles.

Assumption: The prism is right; h is perpendicular to both bases.

B is one base area and P is its perimeter.



Surface area: $SA = 2B + Ph$ (square units)

Volume: $V = Bh$ (cubic units)

B = area of one base; P = base perimeter; h = perpendicular height

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Right Cylinder

A solid with two congruent circular bases.

Assumption: The cylinder is right; h is perpendicular to the bases.

The lateral net is a rectangle of width $2\pi r$.



Surface area: $SA = 2\pi r^2 + 2\pi r h$ (square units)

Volume: $V = \pi r^2 h$ (cubic units)

r = base radius; h = perpendicular height

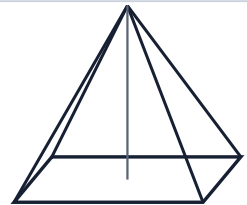
Pyramid

A solid with one polygonal base and triangular faces meeting at an apex.

Assumption: h is perpendicular from the apex to the base.

Assumption: $SA = B + Pl/2$ only for a regular pyramid with one common face slant height l.

For a general pyramid, add the areas of the individual triangular faces.



General surface area: $SA = B + \text{sum of triangular-face areas}$ (square units)

Regular-pyramid surface area: $SA = B + Pl/2$ (square units)

Volume: $V = Bh/3$ (cubic units)

B = base area; P = base perimeter; h = perpendicular height; l = face slant height

Right Cone

A solid with a circular base and one apex.

Assumption: The cone is right; the apex lies above the base center.

l is the slant height from the apex to the base circle.



Surface area: $SA = \pi r^2 + \pi r l$ (square units)

Volume: $V = \pi r^2 h/3$ (cubic units)

r = base radius; h = perpendicular height; l = slant height

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Sphere

All points in space at distance r from one center.

Assumption: r is the radius.

The diameter is $2r$.



Surface area: $SA = 4\pi r^2$ (square units)

Volume: $V = \frac{4\pi r^3}{3}$ (cubic units)

r = radius