Geometry Info Sheet #51

Pyramids

Definitions

Pyramid: A polyhedron with a single n-sided polygonal **base** and n other **lateral faces**, each sharing an edge with a side of the base; the lateral faces are triangles that share a single vertex, which is known as the **vertex** (or apex) of the pyramid; like a prism, a pyramid has no curves (only flat surfaces) and is named by the shape of its base

Base Edge: The intersection of a lateral face with a side of the base of a pyramid

Lateral Edge: The intersection of two lateral faces of a pyramid

Altitude: The perpendicular segment from the vertex of a pyramid to the plane of its base

Height: The length of the altitude of a pyramid

Right Pyramid: A pyramid in which the vertex lies directly above the centroid of the base

Oblique Pyramid: A pyramid in which the vertex does not lie directly above the centroid of the base

Regular Pyramid: A pyramid in which the base is a regular polygon and the lateral faces are all congruent isosceles triangles; in other words, the lateral edges are all equal in length; a regular pyramid is a special case of a right pyramid, with the base being a regular polygon

Irregular Pyramid: A pyramid in which the base is not a regular polygon

Slant Height: For a regular pyramid, the length of the altitude of a lateral face

Formulas

The **lateral area** L of a **regular pyramid** with base perimeter p and slant height ℓ is given by: $L = \frac{1}{2} p\ell$

The **surface area** S of a **regular pyramid** with base area B, lateral area L, base perimeter p, and slant height ℓ is given by: $S = B + L$ **or** $S = B + \frac{1}{2} p\ell$

The **volume** V of **any pyramid** with base area B and height h is given by: $V = \frac{1}{3} Bh$