

ENGINEERING DESIGN GEOMETRIC CONSTRUCTION/PLANES

CONCEPT Geometric construction is a method of creating mathematical figures using only a compass and a straightedge. It involves drawing lines and circles to create various shapes, angles and intersections. A critical concept in geometric construction is the idea of planes, which are flat, two-dimensional surfaces that extend infinitely in all directions. Planes can create geometric figures intersected by lines and other planes to form complex shapes.

EXAMPLES

COMPASS: A tool to draw circles and arcs of a fixed radius.

POINTS: Basic elements of geometric construction used to mark positions on a plane.

ANGLES: The measure of the amount of turns between two intersecting lines or planes.

POLYGONS: Shapes created by connecting multiple line segments to form closed figures.

PLANES: Flat, two-dimensional surfaces that extend infinitely in all directions providing a framework for geometric construction.

REAL WORLD CONNECTIONS

The Nebraska state capitol building is based on the neoclassical style and features many geometric elements such as symmetrical facades, circular motifs, and geometric patterns.

The Capitol's construction used geometric principles such as proportion, balance and symmetry to create a sense of harmony and elegance. The exterior of the building is adorned with patterns and shapes, including columns, pediments and domes.

Inside the building, geometric construction is evident in the design of the rotunda, which features a circular shape and a dome with a diameter of 80 feet. The dome's interior is decorated with interlocking triangles, creating a sense of depth and perspective.





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