

Definition: Angle

An **angle** is the figure formed by two rays (half-lines) that share a common endpoint. The common endpoint is called the **vertex** of the angle, and the two rays are called the **sides** of the angle.

Formal Definition

An angle can be defined as:

1. **Geometric Definition:** Given three **Points** A, B, C where $A \neq B$ and $C \neq B$, the angle $\angle ABC$ is the union of rays \overrightarrow{BA} and \overrightarrow{BC} .
2. **Measure Definition:** An angle is associated with a real number called its **measure**, typically expressed in:
 - **Degrees:** A full rotation is 360°
 - **Radians:** A full rotation is 2π radians
 - **Gradians:** A full rotation is 400 gradians
3. **Vector Definition:** The angle θ between two non-zero vectors \vec{u} and \vec{v} is defined by:

$$\cos \theta = \frac{\vec{u} \cdot \vec{v}}{|\vec{u}||\vec{v}|}$$

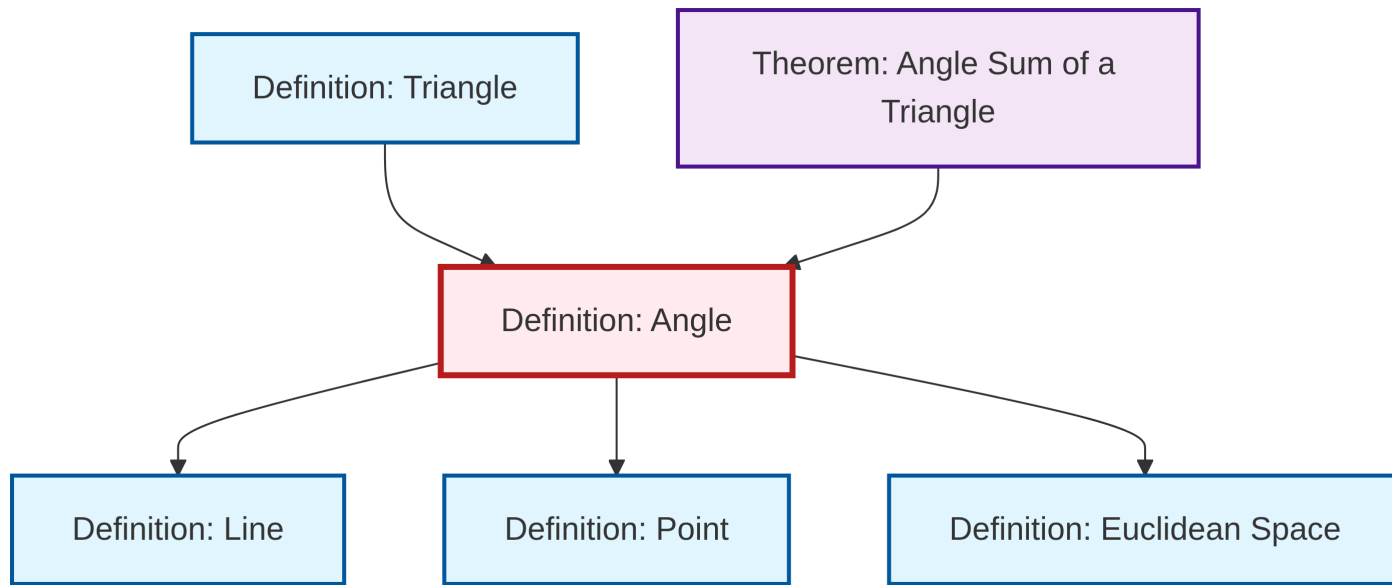
Classification

Angles are classified by their measure: - **Acute angle:** $0^\circ < \theta < 90^\circ$ - **Right angle:** $\theta = 90^\circ$ - **Obtuse angle:** $90^\circ < \theta < 180^\circ$ - **Straight angle:** $\theta = 180^\circ$ - **Reflex angle:** $180^\circ < \theta < 360^\circ$

Properties

- The angle measure is invariant under rotation and translation
- In **Euclidean Space**, angles satisfy the angle addition postulate
- Two angles are **congruent** if they have the same measure
- **Complementary angles** sum to 90°
- **Supplementary angles** sum to 180°

Dependency Graph



Local dependency graph