# Planes

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May 4, 2024

# Definition of a plane

- Planes are described by the vectors that exist on it, along with a normal vector.
- This is similar to a line, defined as a series of points along with a direction vector

# Vectors and dot products

- A vector can be defined as the line that goes from one point to another
- Given two points, $P_0$ and P, you can define the vector $\vec{v} = P - P_0$
- The vector equation of a plane is given by
  - $\vec{n} \cdot \vec{v} = 0$

# Other equations of a plane

- scalar equation of a plane is given by
  - $a(x - x_0) + b(y - y_0) + c(z - z_0) = 0$
- linear equation of a plane is given by
  - $ax + by + cz + d = 0$