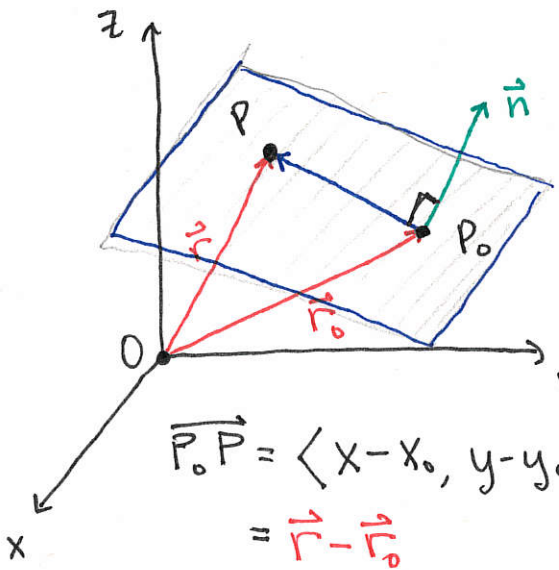
Planes in $\mathbb{R}^3$: one point and a normal direction determine a plane



$$\overrightarrow{P_0P} = \langle x-x_0,\ y-y_0,\ z-z_0 \rangle = \vec{r} - \vec{r}_0$$

Vector eqn: $\vec{n} \cdot (\vec{r} - \vec{r}_0) = 0$

Scalar eqn:

Point-normal form:

$$a(x-x_0) + b(y-y_0) + c(z-z_0) = 0$$

Standard form:

$$ax + by + cz + d = 0$$

↑ also called the "linear" equation of the plane in standard form.

$\vec{n} = \langle a, b, c \rangle$ is normal to the plane

a, b, c are sometimes called the "attitude numbers" of the plane