Nishant Jindal

$$\frac{a\alpha - x_1}{a^2} = \frac{b\beta - y_1}{b^2} = \frac{c\gamma - z_1}{c^2} = \frac{(x_1, y_1, z_1)}{\frac{a\alpha + b\beta + c\gamma}{a^2+b^2+c^2} - ax_1 - by_1 - cz_1} = \frac{-ax_1 - by_1 - cz_1 - d}{a^2+b^2+c^2}$$

$$\frac{x' - x_1}{a} = \frac{y' - y_1}{b} = \frac{z' - z_1}{c} = -2\left(\frac{ax_1 + by_1 + cz_1 + d}{a^2+b^2+c^2}\right)$$

Foot of the perpendicular from $P(x_1, y_1, z_1)$ on plane $ax + by + cz + d = 0$

Image of point $P$ from plane.

$$\frac{x - x_1}{a} = \frac{y - y_1}{b} = \frac{z - z_1}{c} = -\frac{ax_1 + by_1 + cz_1 + d}{a^2+b^2+c^2}$$

$$\frac{\frac{x_1 + x'}{2} - x_1}{a} = \frac{\frac{y_1 + y'}{2} - y_1}{b} = \frac{\frac{z_1 + z'}{2} - z_1}{c} = -\frac{ax_1 + by_1 + cz_1 + d}{a^2+b^2+c^2}$$