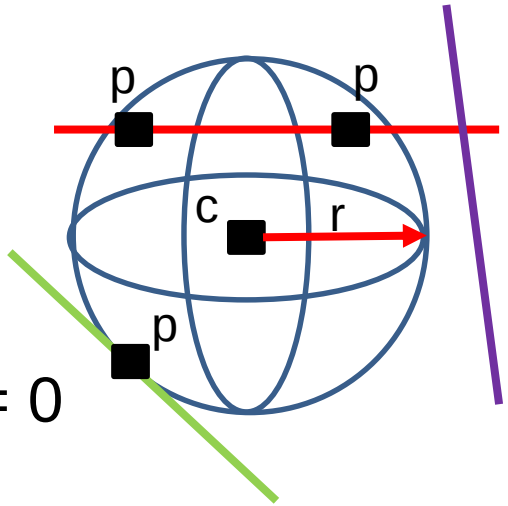
General Primitives - Spheres

Spheres vs lines

$(p-c) \bullet (p-c) - r^2 = 0$

Where $p_t = p_0 + t * v$



$((p_0 + t * v) - c) \bullet ((p_0 + t * v) - c) - r^2 = 0$

$t^2*(v \bullet v) + t * 2v \bullet (p_0 - c) + (p_0 - c) \bullet (p_0 - c) - r^2 = 0$

This is a quadratic equation where:

$A = (v \bullet v)$

$B = 2v \bullet (p_0 - c)$

$C = (p_0 - c) \bullet (p_0 - c) - r^2$

$$t = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$