8) If p is the length of perpendicular from origin to the line $\frac{x}{a} + \frac{y}{b} = 1$, then prove that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

Given line $\frac{x}{a} + \frac{y}{b} = 1$

OR $bx + ay - ab = 0$

distance from origin,

$$d = \frac{|b(0) + a(0) - ab|}{\sqrt{b^2 + a^2}}$$

$$p = \frac{|ab|}{\sqrt{a^2 + b^2}}$$

$$p^2 = \frac{a^2 b^2}{a^2 + b^2}$$

$$\frac{1}{p^2} = \frac{a^2 + b^2}{a^2 b^2}$$

$$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$$