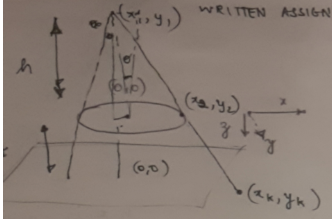
WRITTEN ASSIGNMENT



center $(x_1, y_1) \rightarrow$ fixed

$$\frac{x_k - x_1}{x_2 - x_1} = \frac{f+h}{h}.$$

$$x_k = (x_2 - x_1)\frac{f+h}{h} + x_1$$

$$\frac{(x_k - x_1)h}{f+h} + x_1 = x_2$$

similarly $\frac{(y_k - y_1)h}{(f+h)} + y_1 = y_2$

now $y_2^2 + x_2^2 = r^2 \longrightarrow$ circle.

now $h = \frac{\sqrt{x_1^2 + y_1^2}}{2}$

$$\therefore \frac{(x_k - x_1)^2 h^2}{(f+h)^2} + \frac{(y_k - y_1)^2 h^2}{(f+h)^2} = r^2$$

Equation of ~~an~~ ~~ellipse~~. a circle.

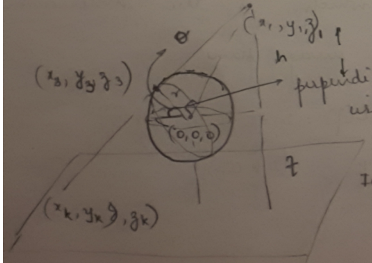
$A_I = 1\,mm^2$

$A_I \propto 1/f^2$.

$\therefore$ when ~~foco~~ the distance increases to $2f$

$$\frac{A_I'}{A_I} = 1/2^2 = 1/4.$$

$\therefore A_I' = 1/4\,mm^2$.



centre $\rightarrow (x_1, y_1, z_1)$

$z_3 = r \sin\theta$.

$$x_k = (x_2 - x_1)\frac{f+h}{h} + x_1$$

Imaging plane $\frac{(x_k - x_1)h}{(f+h)} + x_1 = x_2$

similarly

$$\frac{y_k - y_1}{(f+h)} h + y_1 = y_2$$

$$x_2^2 + y_2^2 + z_2^2 = r^2 .$$

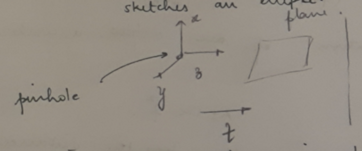
$$\frac{(x_k - x_1)^2 h^2}{(f+h)^2} + \frac{(y_k - y_1)^2 h^2}{(f+h)^2} + r^2 \sin^2\theta = r^2$$

h ~~x~~ is a function of θ.

$h = \sqrt{x_1^2 + y_1^2 + z_1^2} \cos($

$$\therefore \quad \frac{(x_k - x_1)^2 h^2}{(f+h)^2} + \frac{(y_k - y_1)^2}{(f+h)^2} h^2 = r^2 \cos^2\theta .$$

The axes length depends on the inclination, $\because$ as r, θ varies, it sketches an ellipse.



The image plane is given by $z = f$.

now the line is on $Ax + By + Cz + D$. plane

for lines on the plane, vanishing points lie on the ~~the~~ vanishing line for the plane. w.r.t the origin which is the intersection of the plane with the image plane.

ie $\quad Ax + By + C(f) + D = 0$

or $\quad Ax + By = -(D + C(f))$