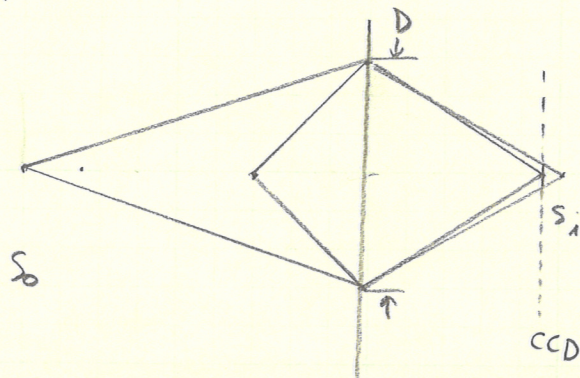


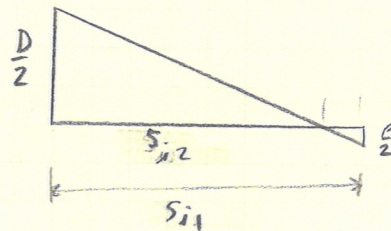
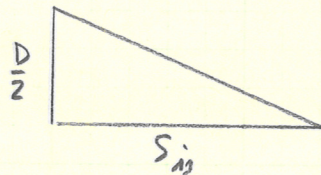
# Depth of Focus

Thin lens with stop at the lens

What change in object space distance will remain on a pixel?

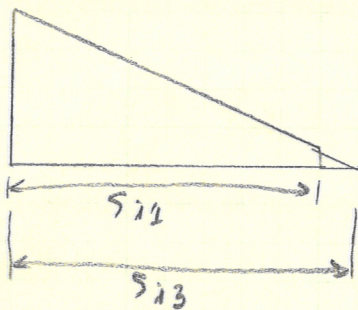


pixel size:  $p$



$$\frac{D/2}{s_{i2}} = \frac{p/2}{s_{i1} - s_{i2}}$$

$$\begin{aligned} D(s_{i1} - s_{i2}) &= p s_{i2} \\ s_{i2}(p + D) &= s_{i1} D \\ s_{i2} &= s_{i1} \frac{D}{D+p} \end{aligned}$$



$$\frac{D/2}{s_{i3}} = \frac{p/2}{s_{i3} - s_{i1}}$$

$$D(s_{i3} - s_{i1}) = p s_{i3}$$

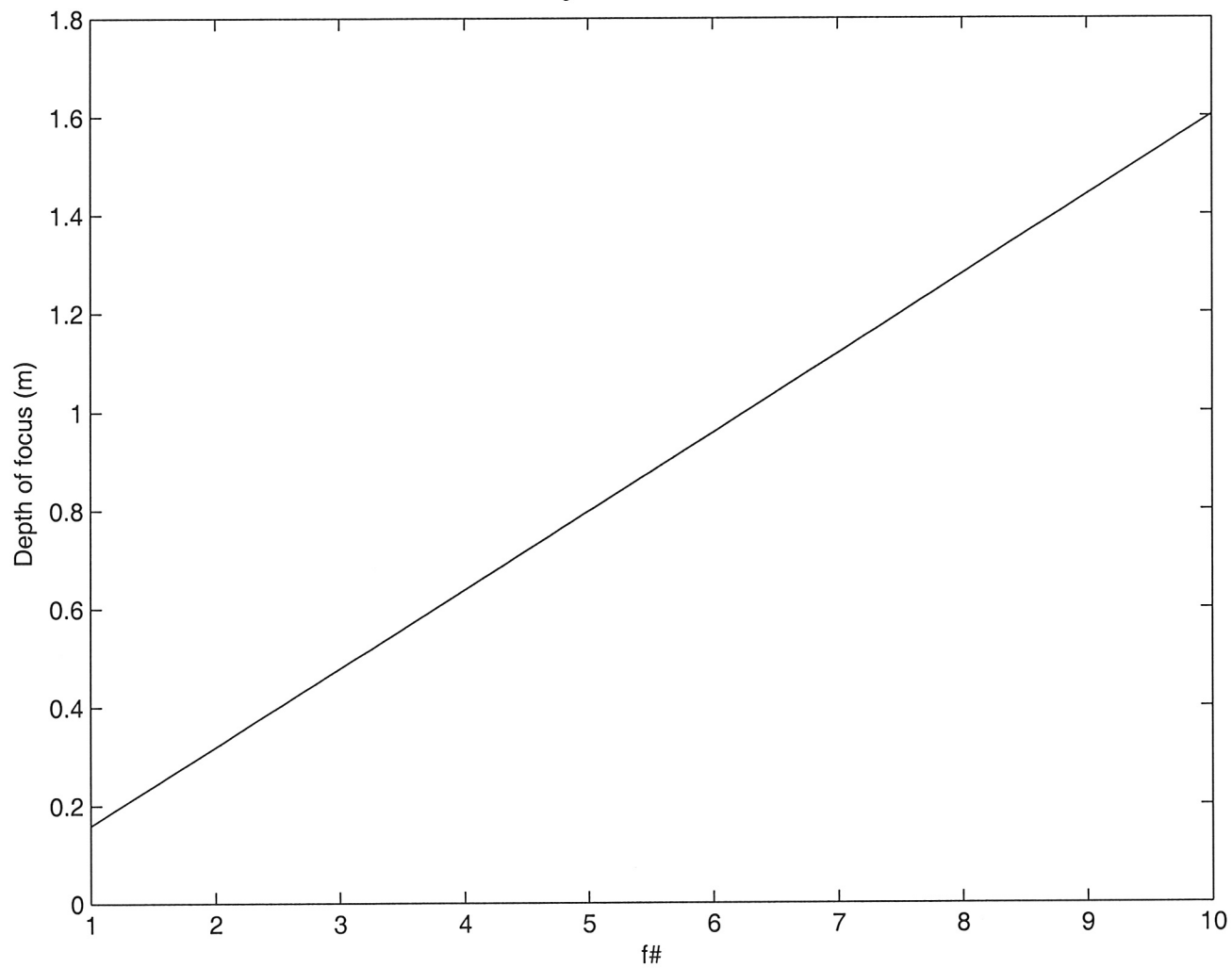
$$s_{i3}(D - p) = D s_{i1}$$

$$s_{i3} = s_{i1} \frac{D}{D-p}$$

$$s_o = \frac{f s_i}{s_i - f}$$

If  $s_o \gg f$

$S_o = 10\text{m}, f = 50\text{mm}$



f#= 3, f= 50mm

