

A	B	C
H	I	I
H	I	O
H	O	I
H	O	O
O	H	I
O	H	O
O	O	I
O	O	O

Intersection

segment AB

$$x = A + s(B-A) \quad 0 \leq s \leq 1$$

$$\vec{n} \cdot (x - P) = 0$$

plane

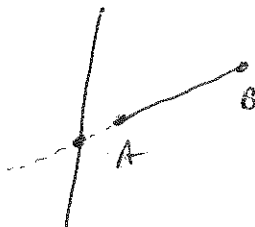
$$\vec{n} \cdot (A + s(B-A) - P) = 0$$

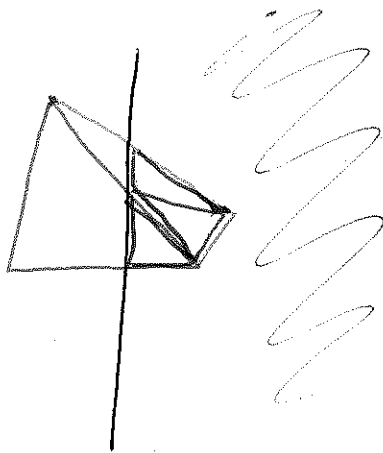
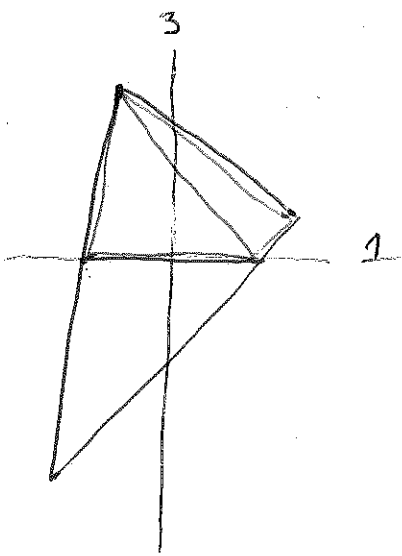
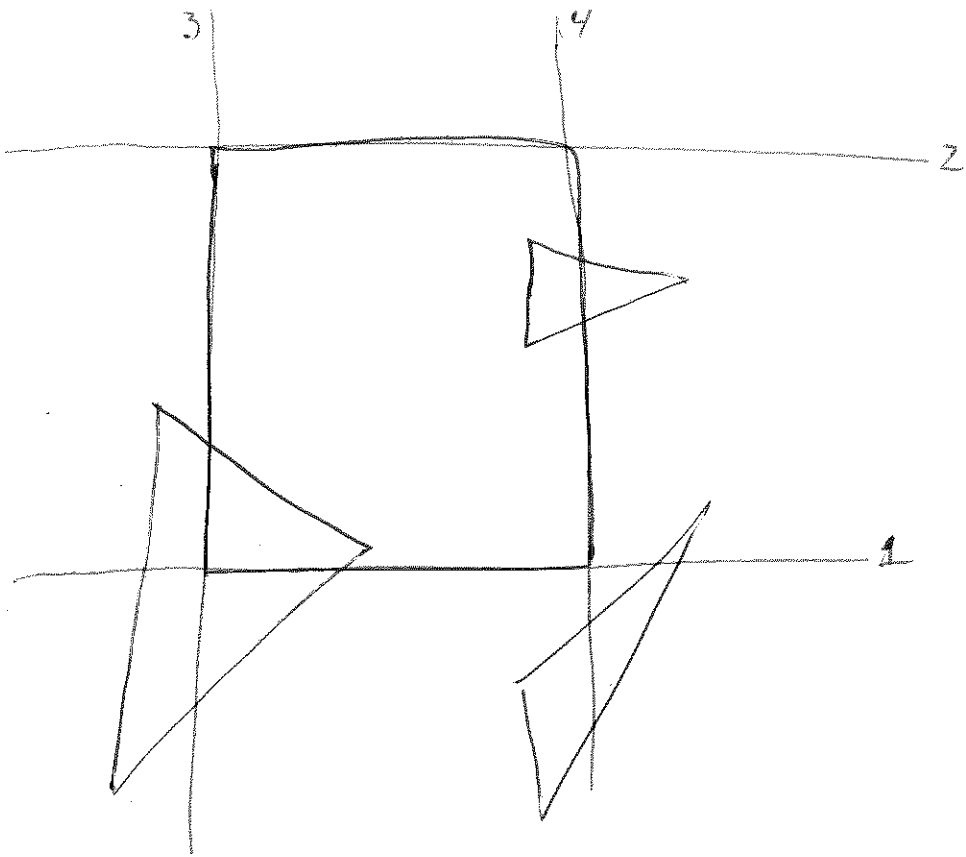
$$s \vec{n} \cdot (B-A) = \vec{n} \cdot (P-A)$$

$$s = \frac{\vec{n} \cdot (P-A)}{\vec{n} \cdot (B-A)}$$

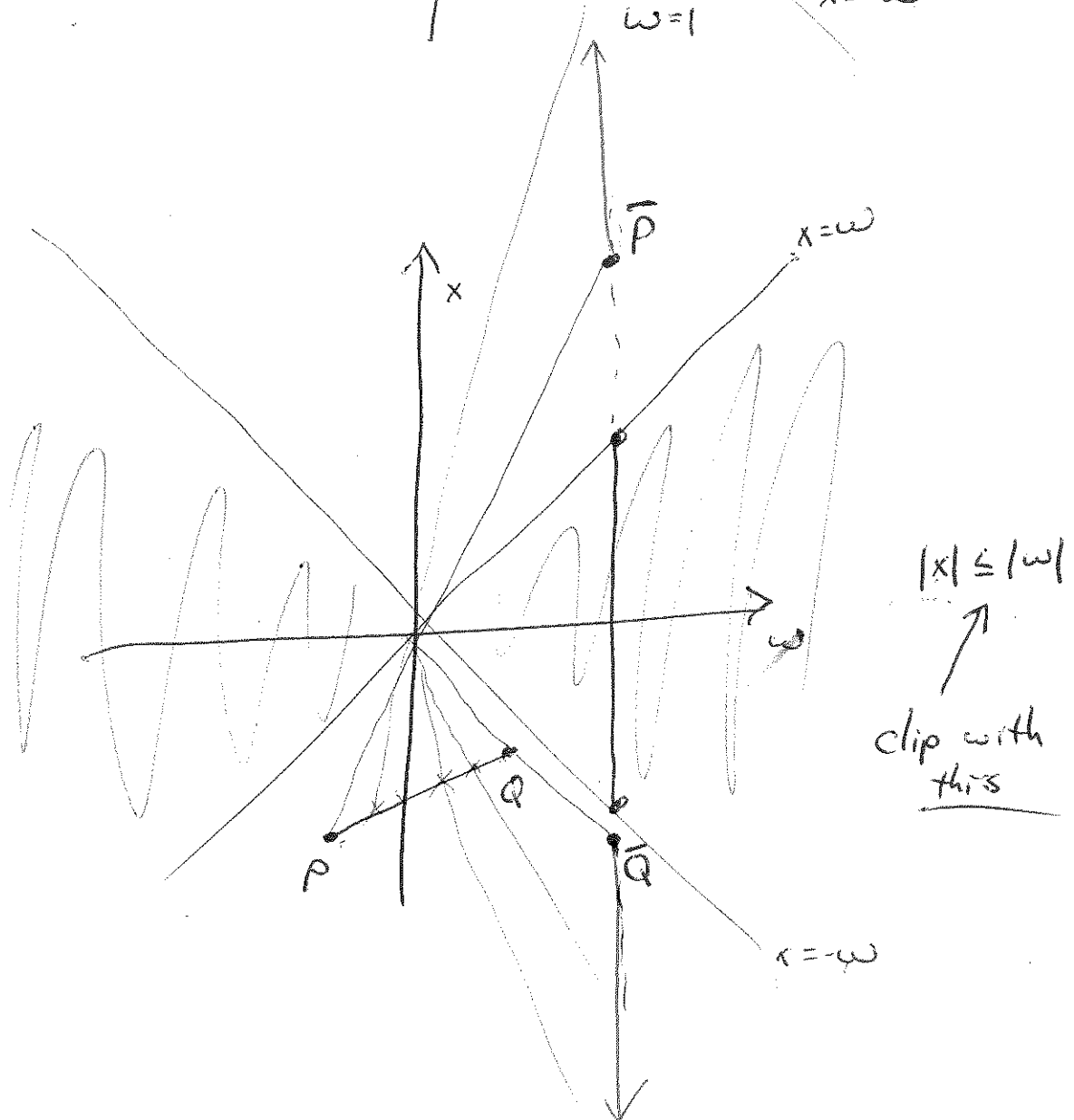
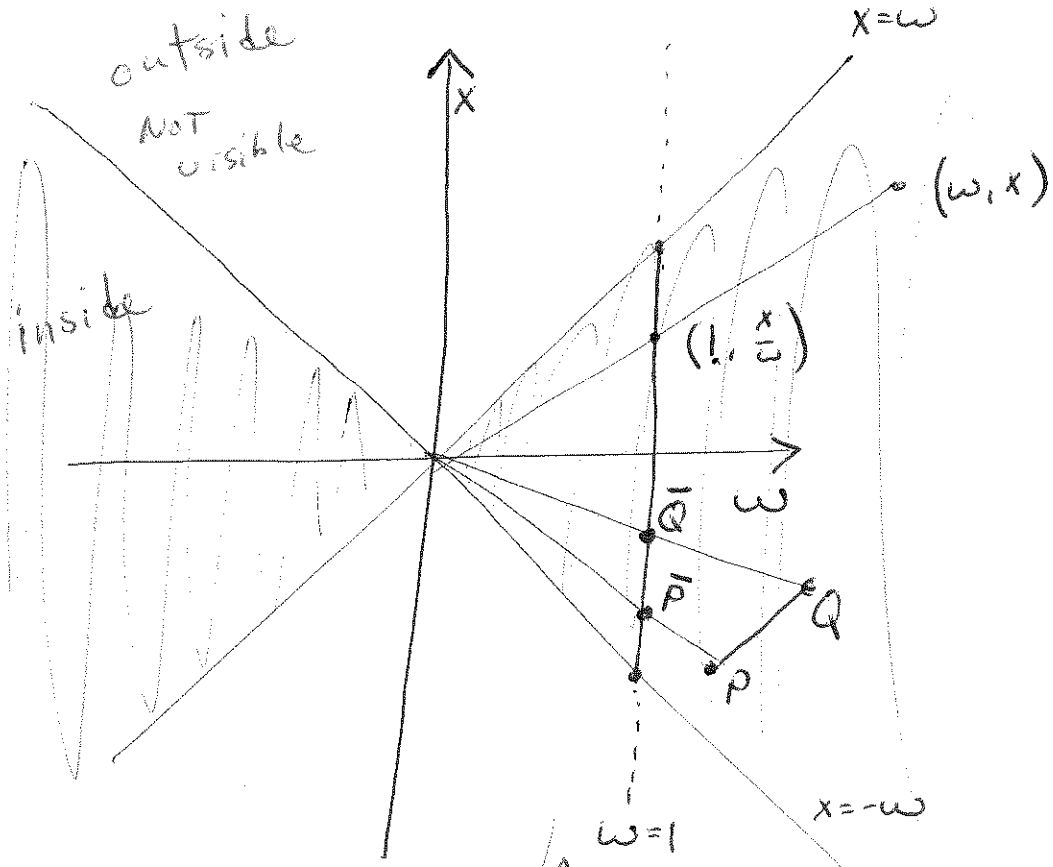
\* divide by 0

\*  $s < 0$  or  $s > 1$





1D



transform  $\rightarrow$  divide  $w$   $\rightarrow$  clip  $\rightarrow$  rasterize BAD  
Fail!

transform  $\rightarrow$  clip  $\rightarrow$  divide  $w$   $\rightarrow$  rasterize Good

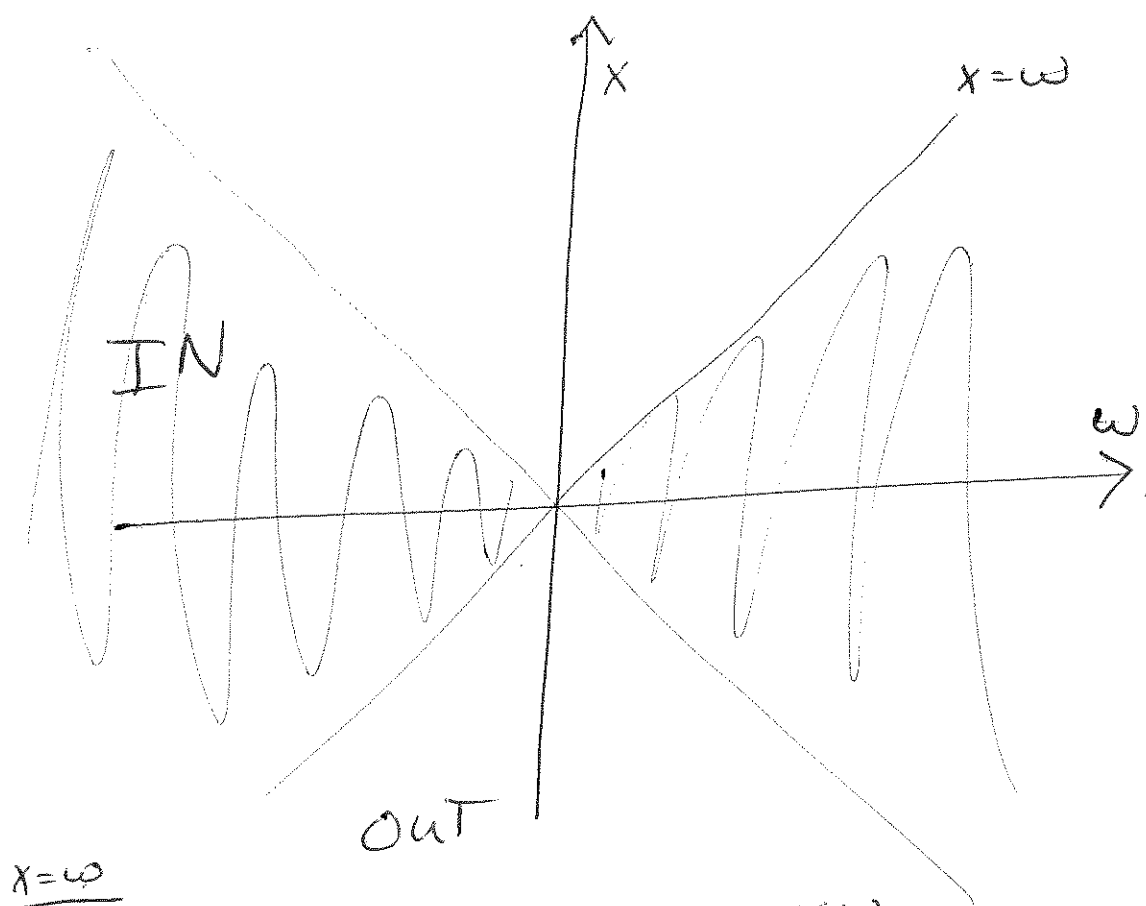
$$\begin{aligned}x &= w \\x &= -w\end{aligned}$$

$$\begin{aligned}y &= w \\y &= -w\end{aligned}$$

$$\begin{aligned}z &= w \\z &= -w\end{aligned}$$

$$z = -w$$

$$\frac{z}{w} = -1$$



$x = w$

in if:  $\begin{cases} w \geq 0 \text{ and } x \leq w \\ w \leq 0 \text{ and } x \geq w \end{cases}$

$$p = \begin{pmatrix} x_0 \\ y_0 \\ z_0 \\ w_0 \end{pmatrix}$$

$$q = \begin{pmatrix} x_1 \\ y_1 \\ z_1 \\ w_1 \end{pmatrix}$$

$$\vec{x} = \begin{pmatrix} x_0 + s(x_1 - x_0) \\ y_0 + s(y_1 - y_0) \\ z_0 + s(z_1 - z_0) \\ w_0 + s(w_1 - w_0) \end{pmatrix}$$

A, B, C

$$(A-B) \times (A-C) = 0$$

$$x = p + (q-p)u$$

$$u = u(s)$$

$$\underline{x = w}$$

$$x_0 + s(x_1 - x_0) = w_0 + s(w_1 - w_0)$$

