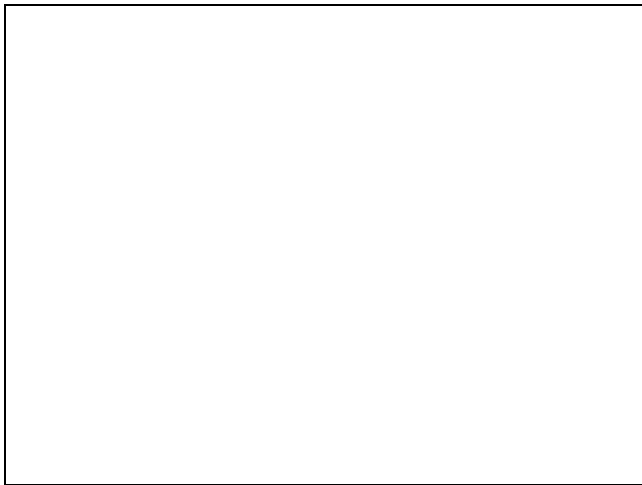


# Transforming from Screen to Window Coordinates

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Screen

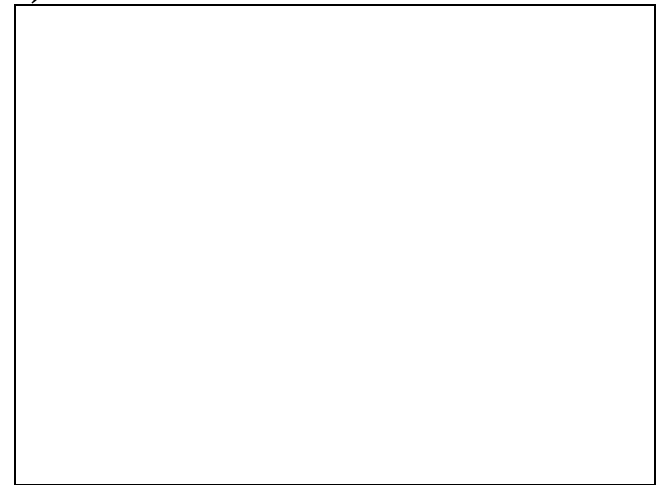
$(1,1)$



$(-1,-1)$

Window

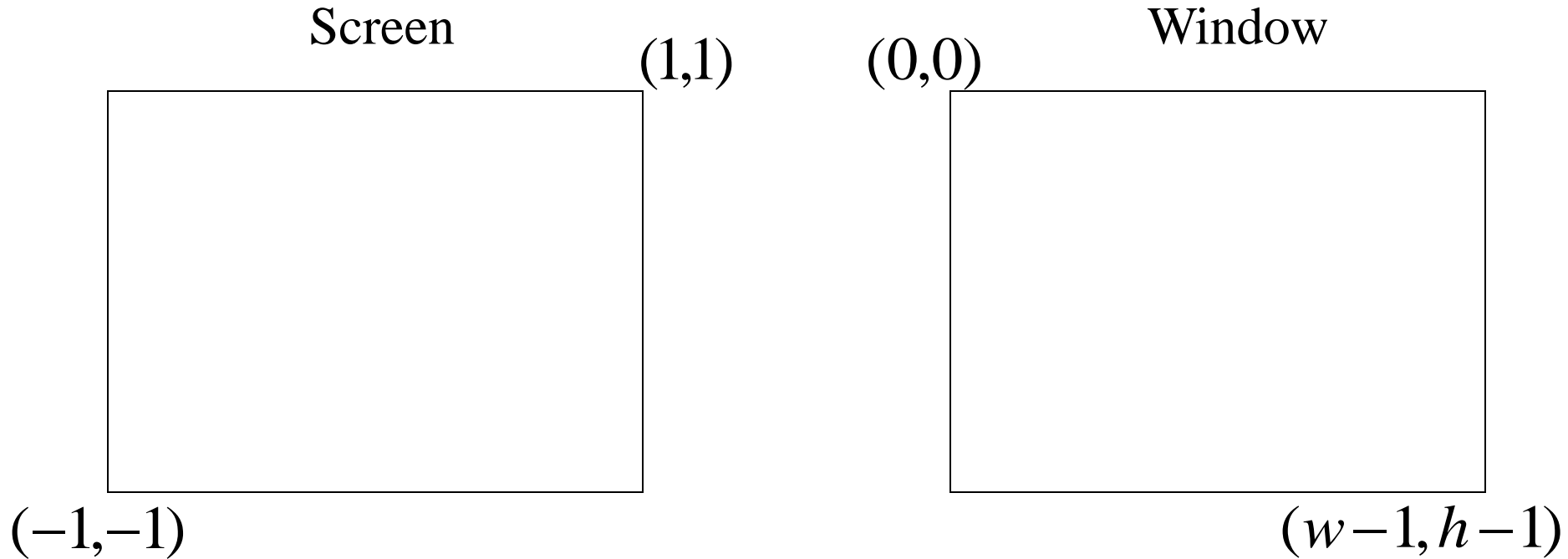
$(0,0)$



$(w-1, h-1)$

# Transforming from Screen to Window Coordinates

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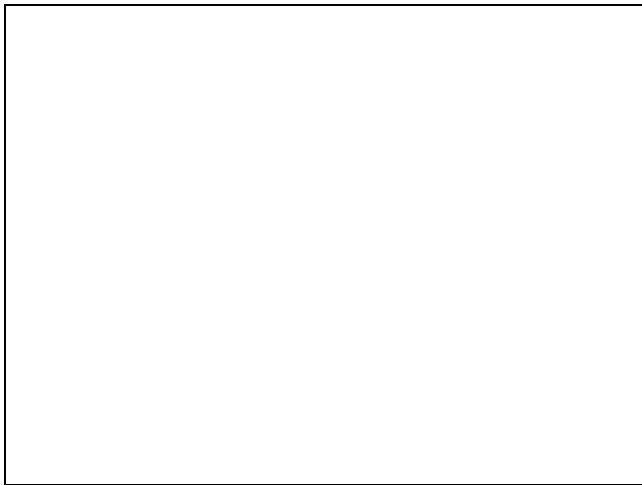
$$M \begin{pmatrix} -1 & 1 & 1 \\ -1 & -1 & 1 \\ 1 & 1 & 1 \end{pmatrix} = \begin{pmatrix} 0 & w-1 & w-1 \\ h-1 & h-1 & 0 \\ 1 & 1 & 1 \end{pmatrix}$$

# Transforming from Screen to Window Coordinates

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Screen

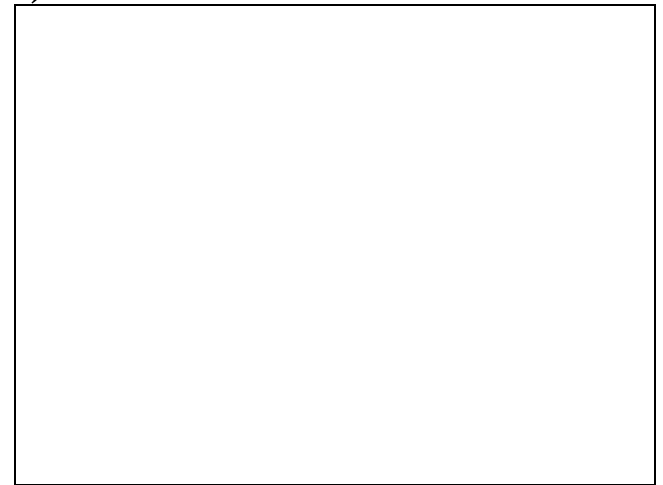
(1,1)



(-1,-1)

(0,0)

Window

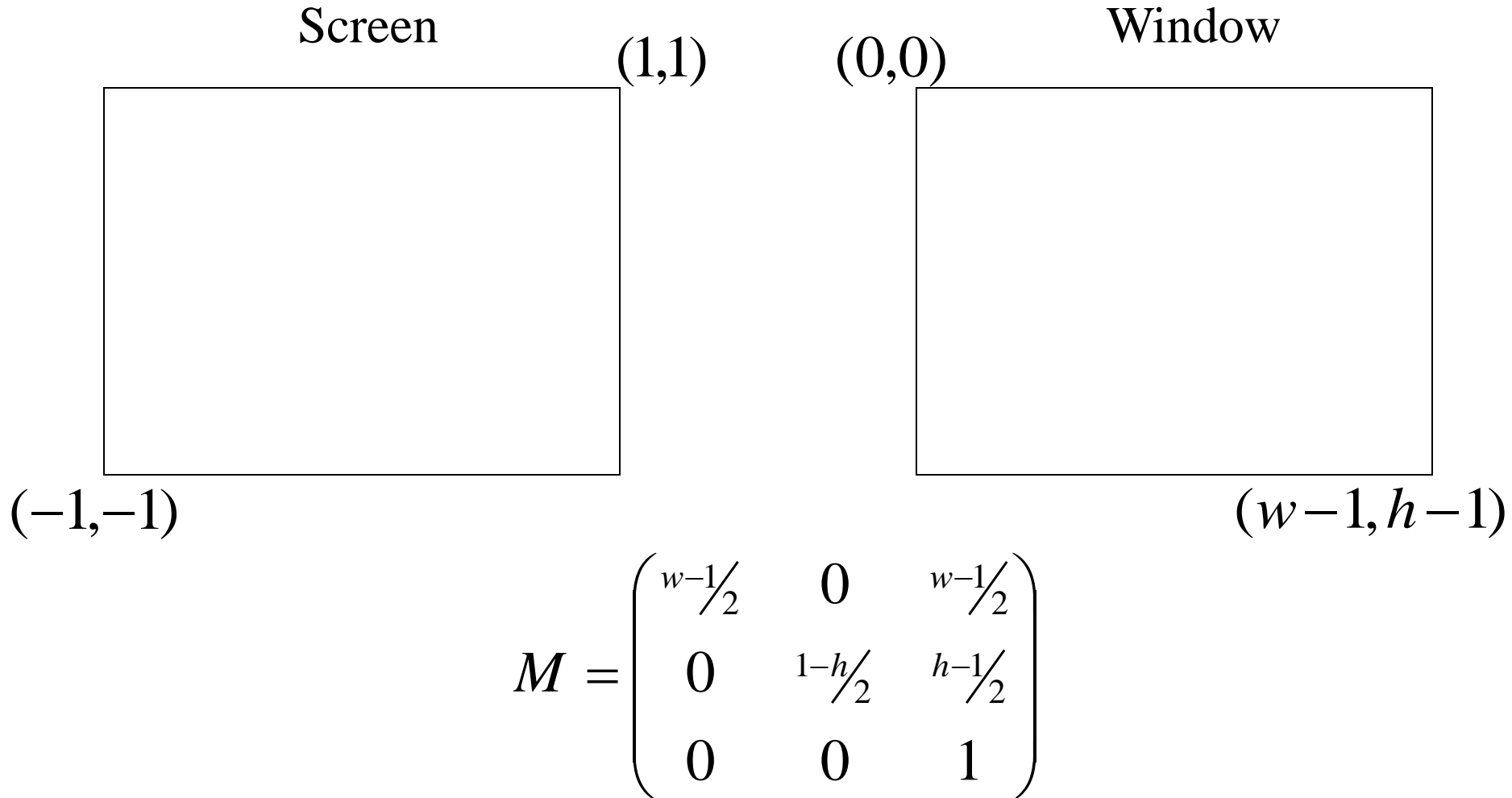


(w-1, h-1)

$$M = \begin{pmatrix} 0 & w-1 & w-1 \\ h-1 & h-1 & 0 \\ 1 & 1 & 1 \end{pmatrix} \begin{pmatrix} -1 & 1 & 1 \\ -1 & -1 & 1 \\ 1 & 1 & 1 \end{pmatrix}^{-1}$$

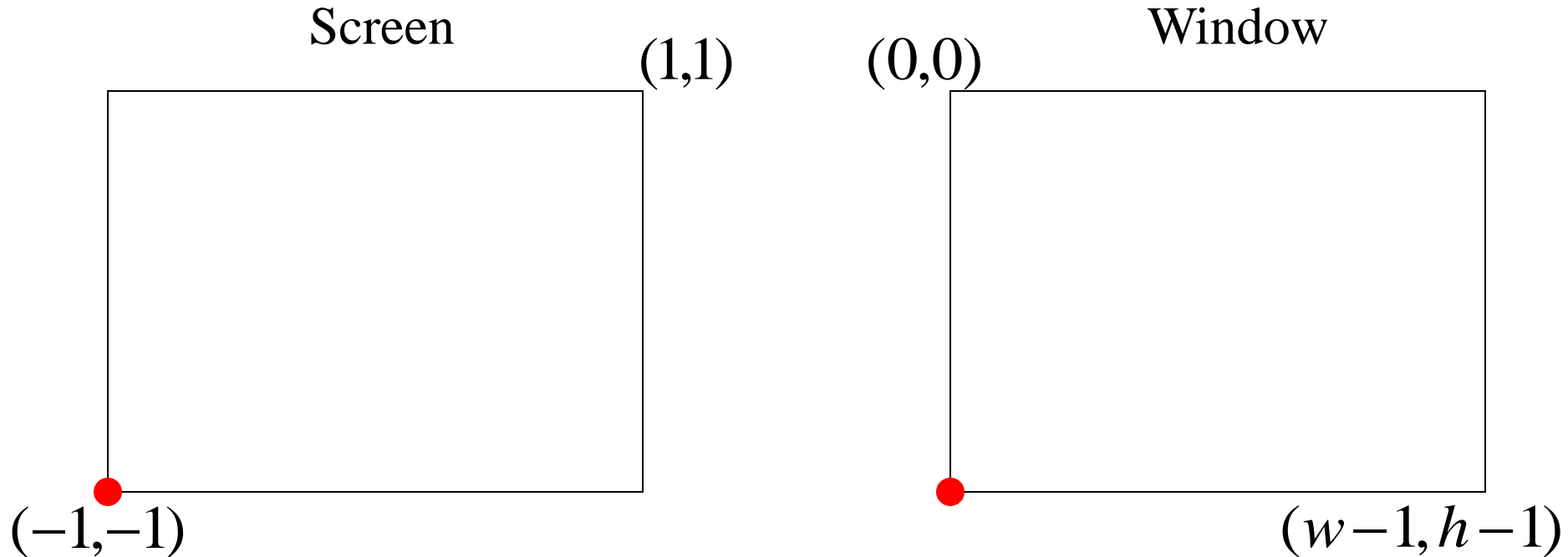
# Transforming from Screen to Window Coordinates

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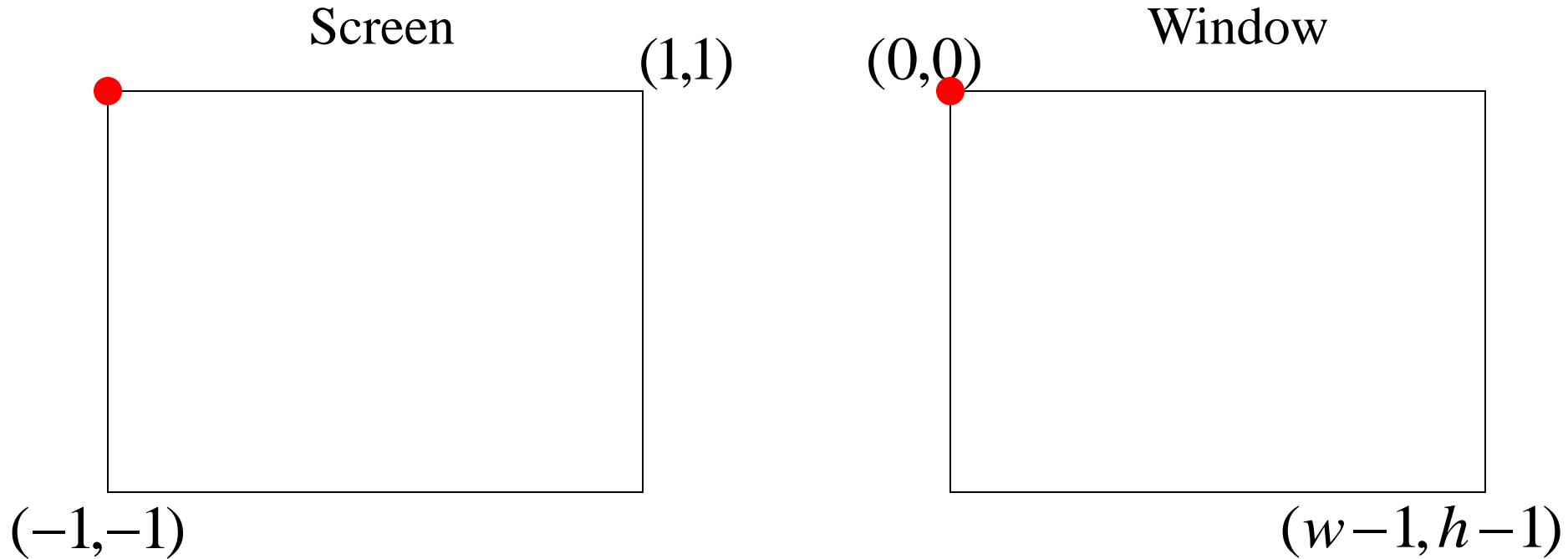
# Transforming from Screen to Window Coordinates

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$$\begin{pmatrix} w-1/2 & 0 & w-1/2 \\ 0 & 1-h/2 & h-1/2 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ -1 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ h-1 \\ 1 \end{pmatrix}$$

# Transforming from Screen to Window Coordinates



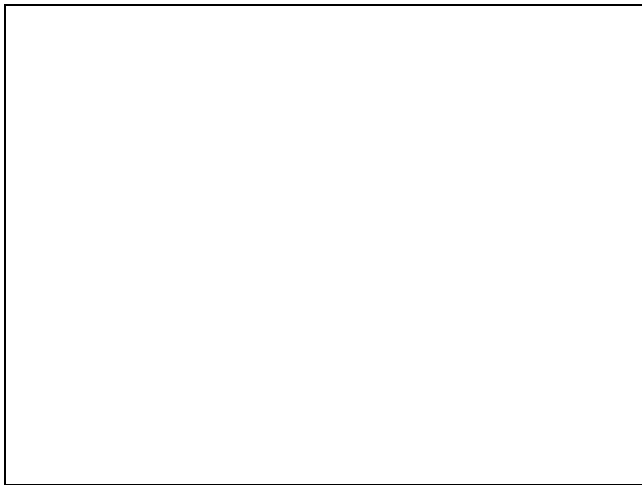
$$\begin{pmatrix} w-1/2 & 0 & w-1/2 \\ 0 & 1-h/2 & h-1/2 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$$

# Transforming from Screen to Window Coordinates

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Screen

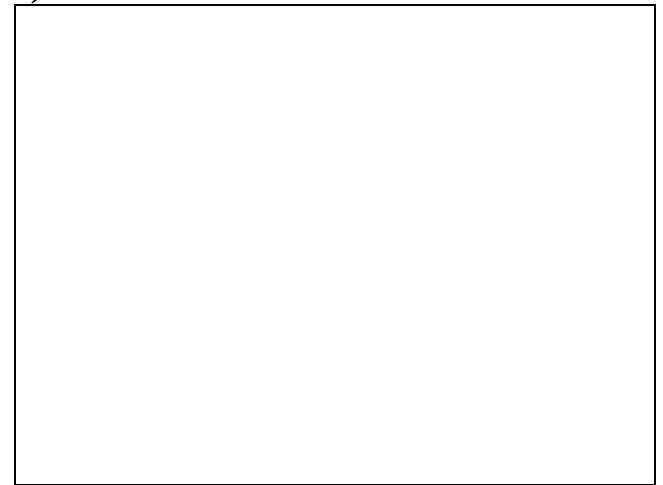
(1,1)



(-1,-1)

Window

(0,0)



(w-1, h-1)

$$\begin{pmatrix} w-1/2 & 0 & w-1/2 \\ 0 & 1-h/2 & h-1/2 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ 1 \end{pmatrix} = \begin{pmatrix} w-1/2(1+x) \\ h-1/2(1-y) \\ 1 \end{pmatrix}$$