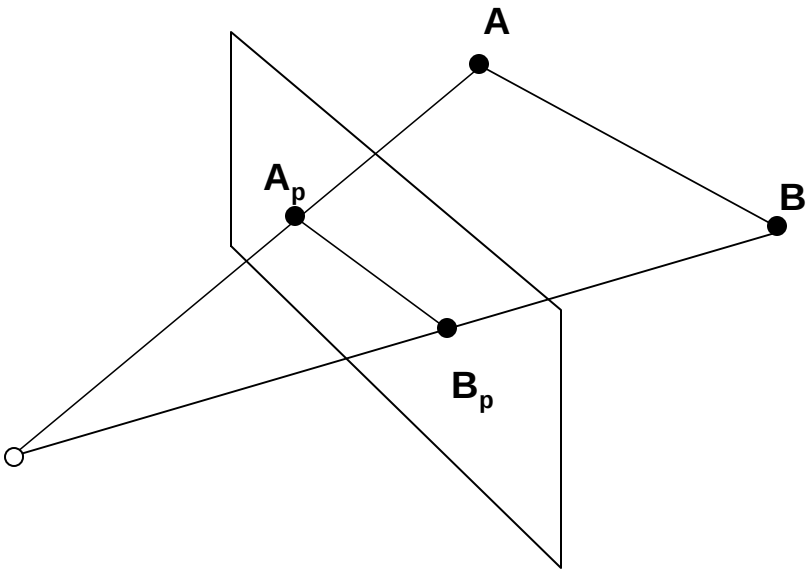
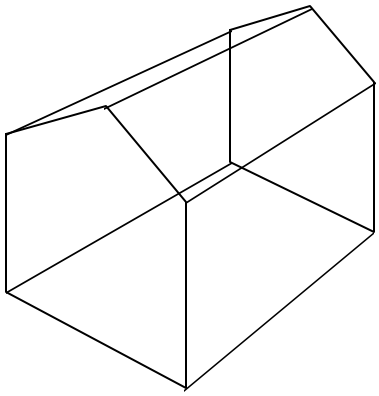
Projeções Planas

Projeções Planas Cônicas

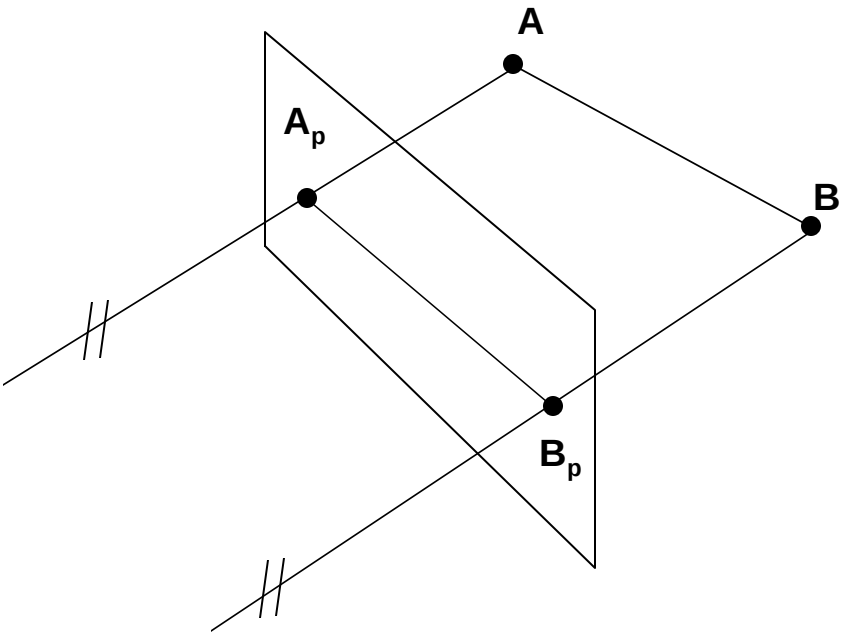


☺ *realista*



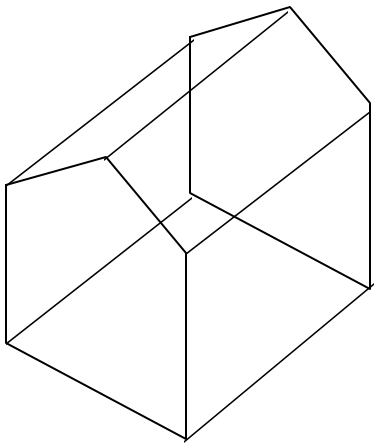
☹ *não preserva escala*
☹ *não preserva ângulos*

Projeções Planas Paralelas



☹ *pouco realista*

☺ *preserva paralelismo*
☺ *possui escala conhecida*

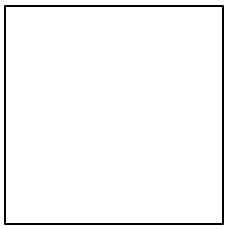


Classificação das projeções planas

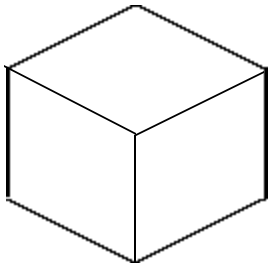
- Paralelas
  - » ortográficas — **dp *//* n**
    - – plantas
    - – elevações
    - – iso-métrica
  - » oblíquas — **dp** não é paralela a **n**
    - – cavaleiras
    - – *cabinet*
- Cônicas
  - » 1 pto de fuga
  - » 2 ptos de fuga
  - » 3 ptos de fuga

Projeções de um cubo

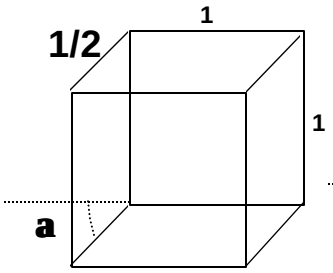
- **Paralelas**



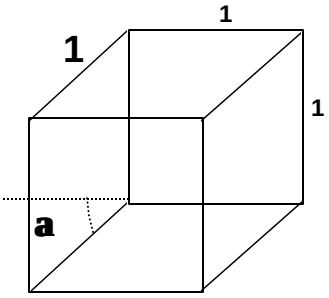
planta ou elevação



iso-métrica

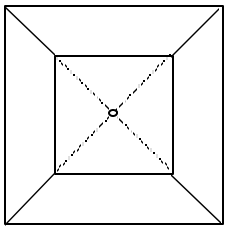


Cabinete (a=45 ou 90)

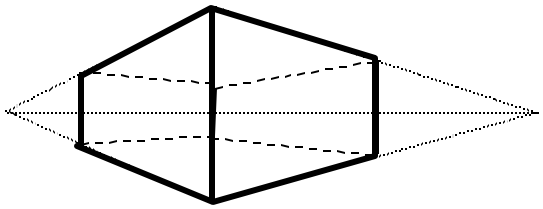


Cavaleira (a=45 ou 90)

- **Cônicas**



1 pto de fuga

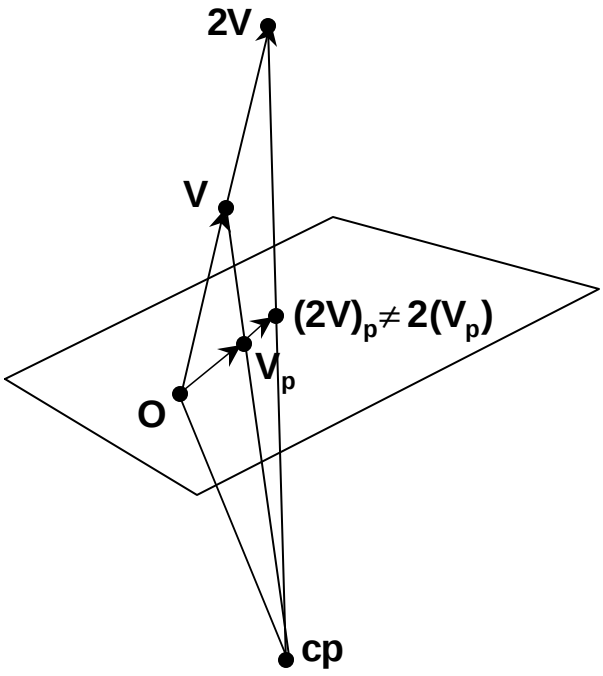


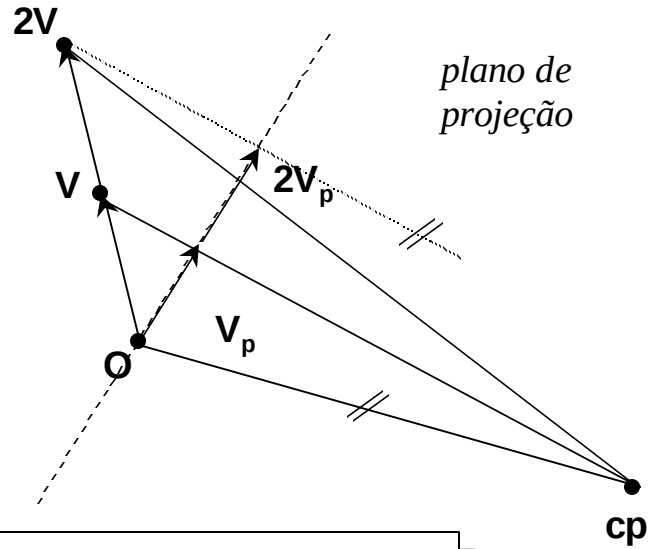
2 ptos de fuga

Projeção plana é uma transformação linear?

Ou seja**:**

T(P+Q) = T(P)+T(Q) e
T(aP) = aT(P) ?

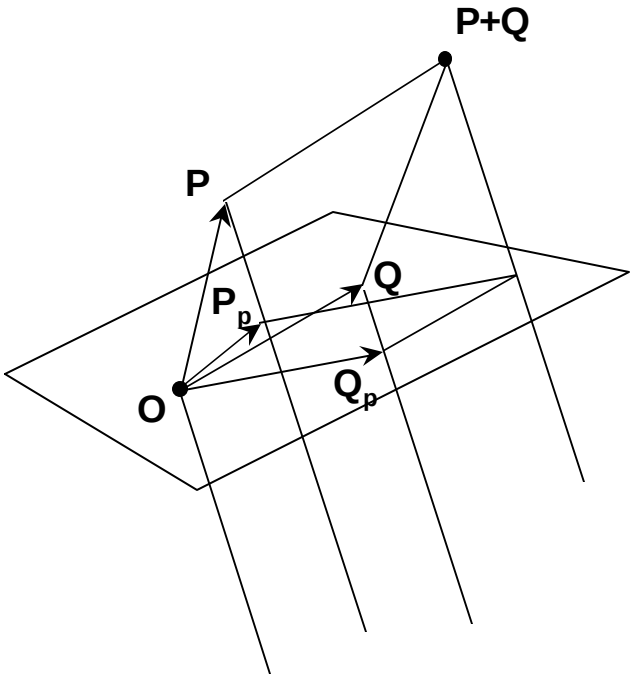




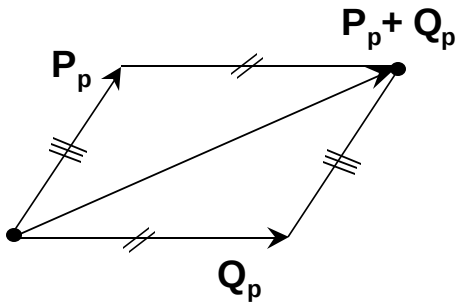
Projeções cônicas não são TL, paralelas podem ser.

Projeção plana paralela é uma transformação linear?

T(P+Q) = T(P)+T(Q) ?



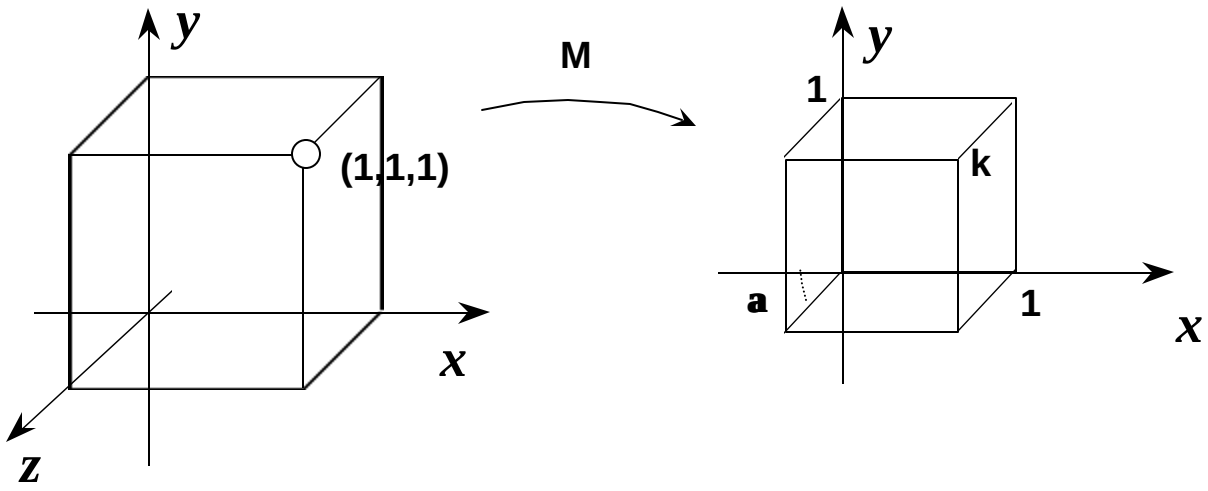
retas paralelas
projetam em paralelas



T(0) = 0 ?

Projeção paralela em plano que passa pela origem é uma transformação linear

Matrizes de projeções Cavaleiras e Cabinetes



$\hat{A}^3$ $\hat{A}^2$

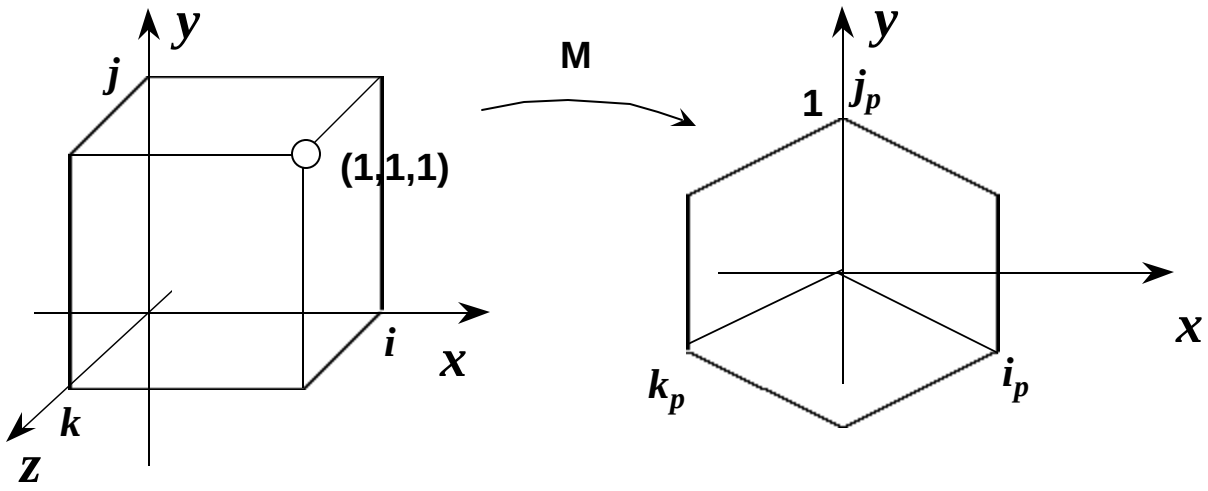
T(1,0,0) = (1,0)

T(0,1,0) = (0,1)

T(0,0,1) = (-k cos **a**, -k sin **a**)

$$M = \begin{vmatrix} 1 & 0 & -k\cos a \\ 0 & 1 & -k\sin a \end{vmatrix}$$

Matrizes de projeções pseudo-isométricas



$\hat{A}^3$ $\hat{A}^2$

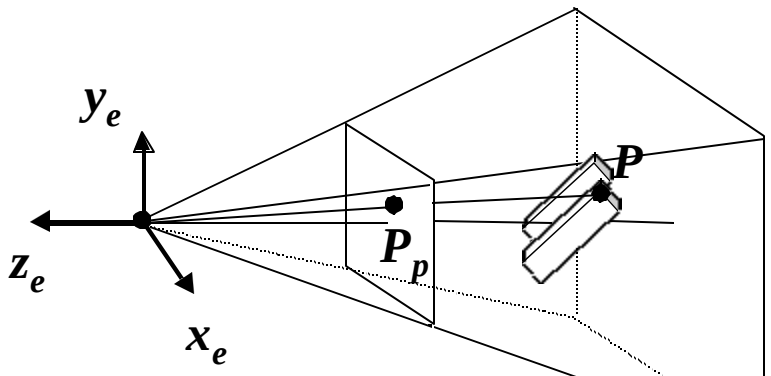
T(1,0,0) = (cos 30 ,-sin 30)

T(0,1,0) = (0,1)

T(0,0,1) = (-cos 30, -sin 30)

$$M = \begin{vmatrix} \cos 30 & 0 & -\cos 30 \\ -\sin 30 & 1 & -\sin 30 \end{vmatrix}$$

Projeção cônica simples



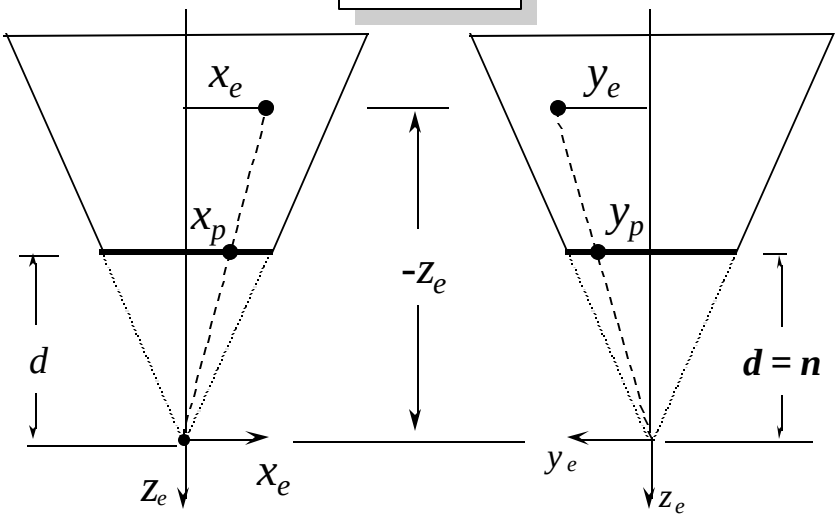
$$P = \begin{pmatrix} x_e \\ y_e \\ z_e \end{pmatrix}$$

$$P_p = \begin{pmatrix} x_p \\ y_p \\ -d \end{pmatrix}$$

$$z_p = -d$$

$$\frac{x_p}{x_e} = \frac{d}{-z_e}$$

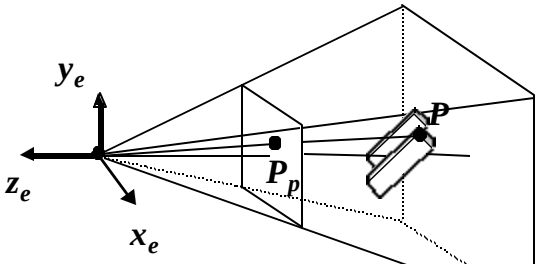
$$x_p = \frac{d}{-z_e}\, x_e$$



$$\frac{y_p}{y_e} = \frac{d}{-z_e}$$

$$y_p = \frac{d}{-z_e}\, y_e$$

Projeção cônica simples



$$x_p = \frac{d}{-z_e}\, x_e$$

$$y_p = \frac{d}{-z_e}\, y_e$$

$$z_p = -d$$

$$\begin{bmatrix} x_p \\ y_p \\ z_p \\ 1 \end{bmatrix} = \begin{bmatrix} d & 0 & 0 & 0 \\ 0 & d & 0 & 0 \\ 0 & 0 & d & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix} \begin{bmatrix} x_e \\ y_e \\ z_e \\ 1 \end{bmatrix} = \begin{bmatrix} d\, x_e \\ d\, y_e \\ d\, z_e \\ -z_e \end{bmatrix} = \begin{bmatrix} (d/-z_e)\, x_e \\ (d/-z_e)\, y_e \\ -d \\ 1 \end{bmatrix}$$

w $\qquad \div w$