

AXONOMETRY

Lecture 10

12 Dec 2022

O - origin of the rectangular coordinate system.

$OX \perp OY \perp OZ$ - segments of unit lengths (1u) along coordinate axes.



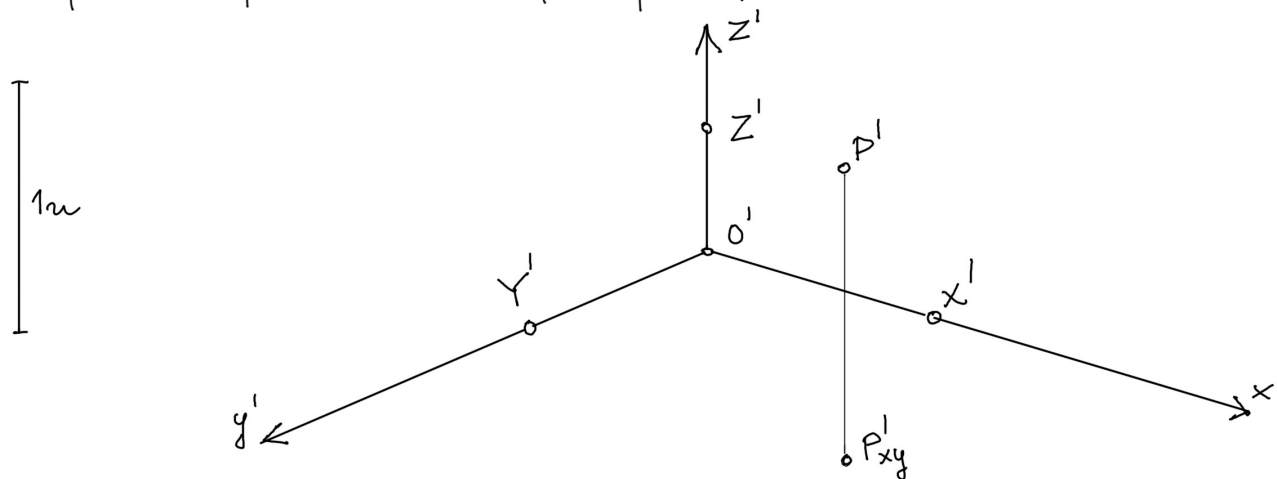
O' - axonometric projection of the origin

$O'X', O'Y', O'Z'$ (not colinear) - axonometric projections of OX, OY, OZ .

L 10 : OBLIQUE
AXONOMETRY

ORTHOGONAL
AXONOMETRY : L 11

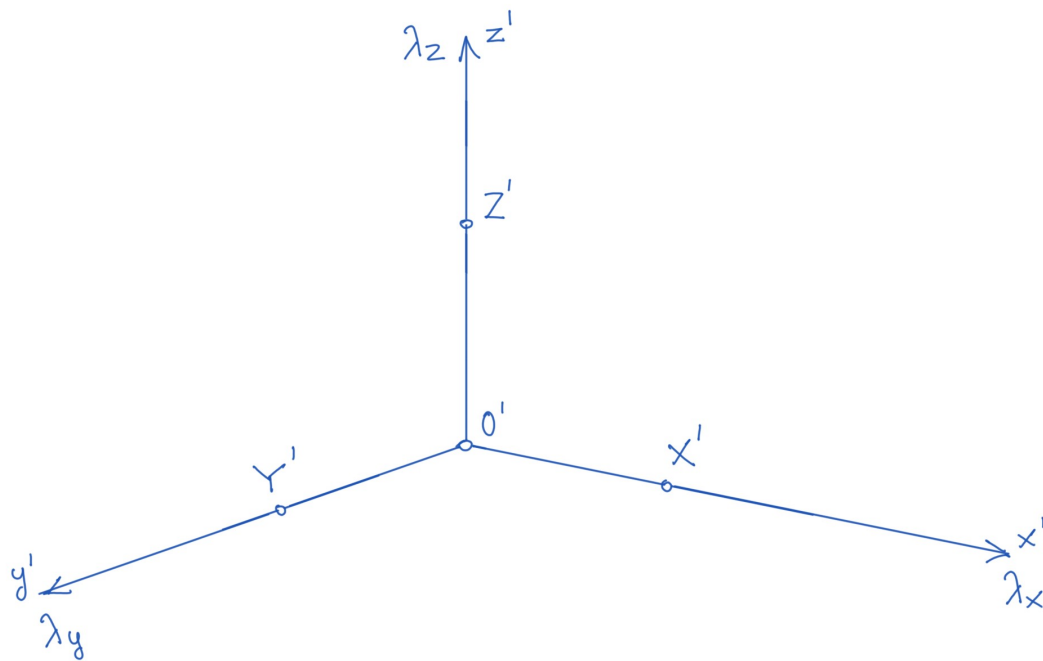
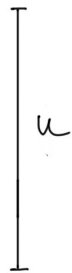
Example (representation of a point)



$P \mapsto (P', P'_{xy})$
or P'_{xz}
or P'_{yz}

? Find P'_{xz} and P'_{yz} .

1. Triangle of axonometric shortenings



Given:

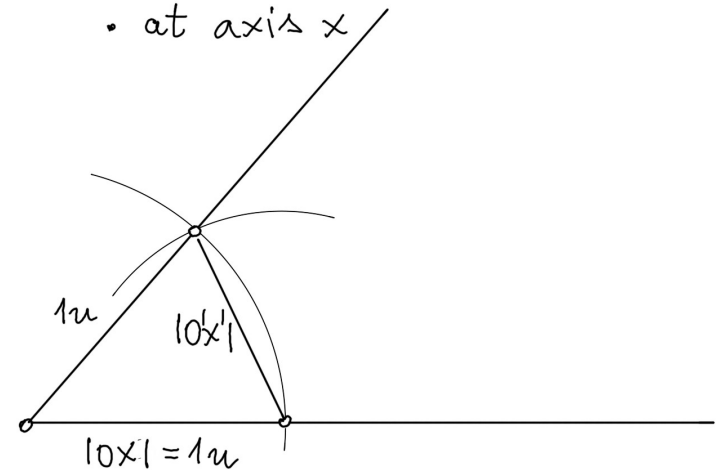
$$|OX| = |OY| = |OZ| = 1u$$

Problem:

Construct triangles of shortenings.

Solution:

- at axis x



$$\lambda_x = \frac{|O'X'|}{|OX|} \leq 1$$

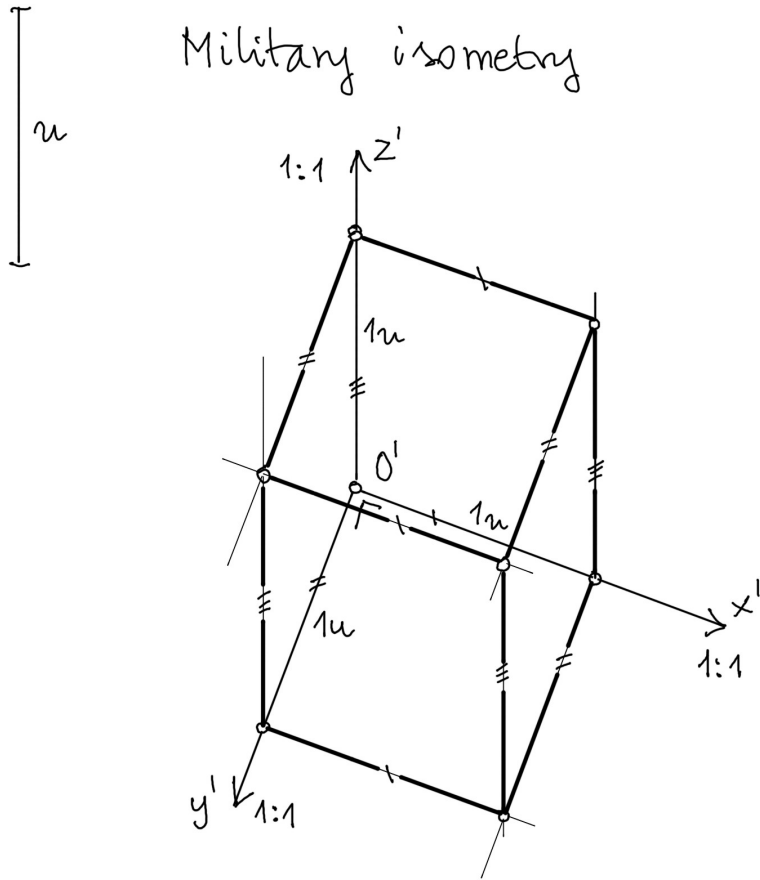
$$\lambda_y = \frac{|O'Y'|}{|OY|} \leq 1$$

$$\lambda_z = \frac{|O'Z'|}{|OZ|} \leq 1$$

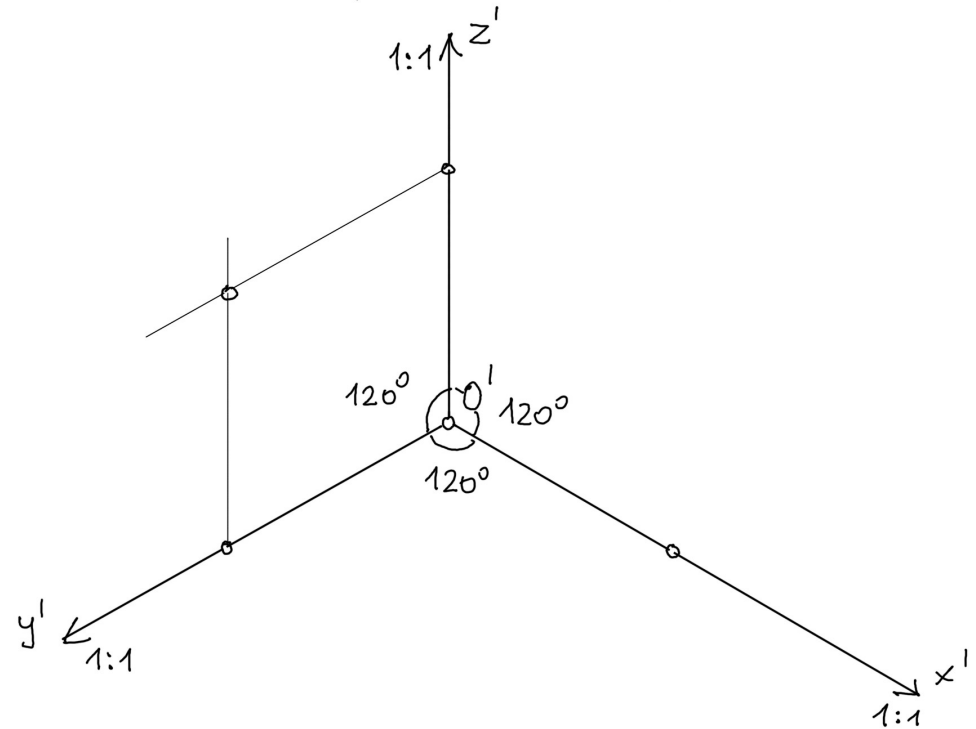
2. Isometries

$$\lambda_x = \lambda_y = \lambda_z$$

Military isometry



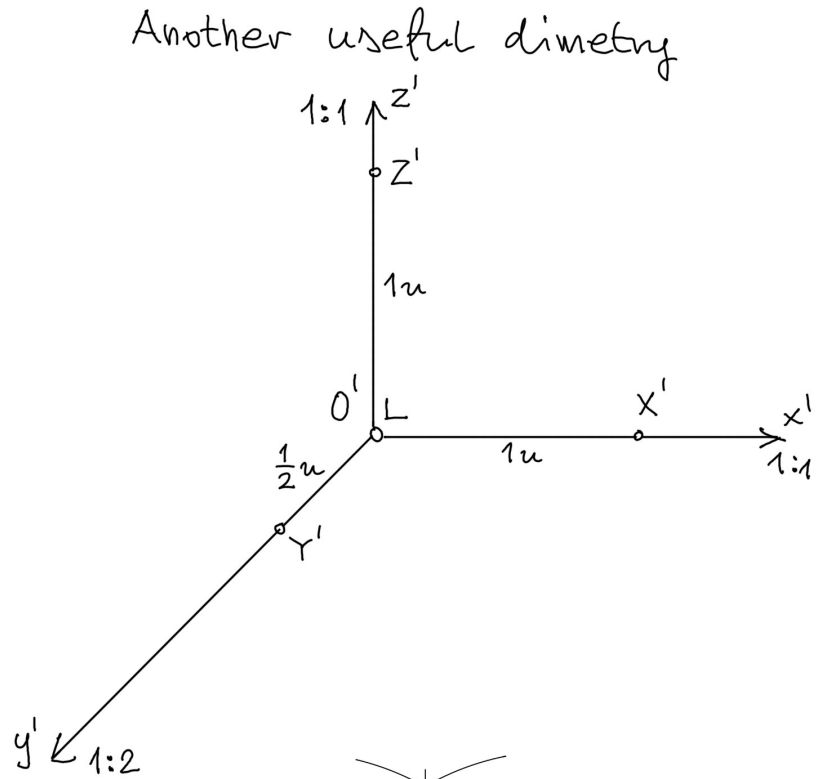
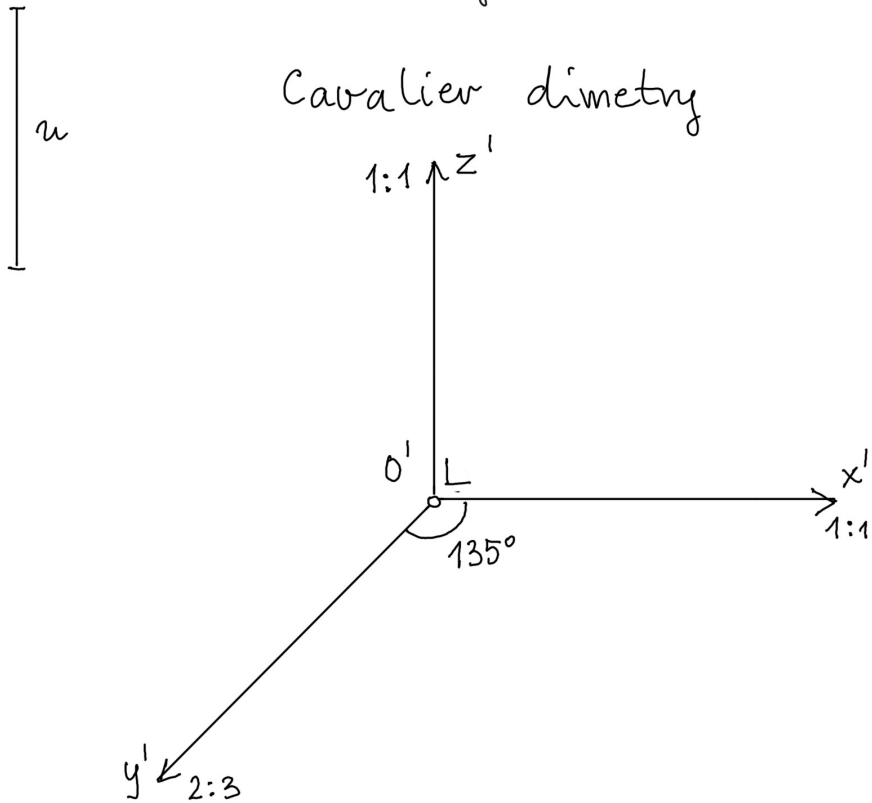
Equiangular isometry



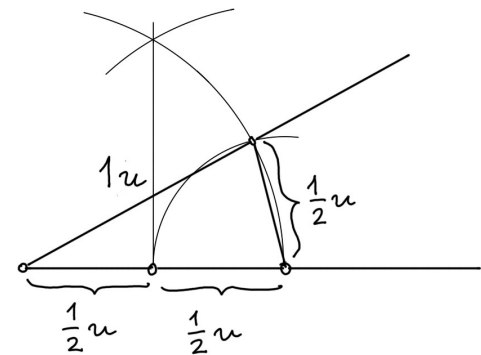
? Draw the isometries of a cube.

3. Dimetries

Equal shortenings at two axes (e.g. $\lambda_x = \lambda_z \neq \lambda_y$)



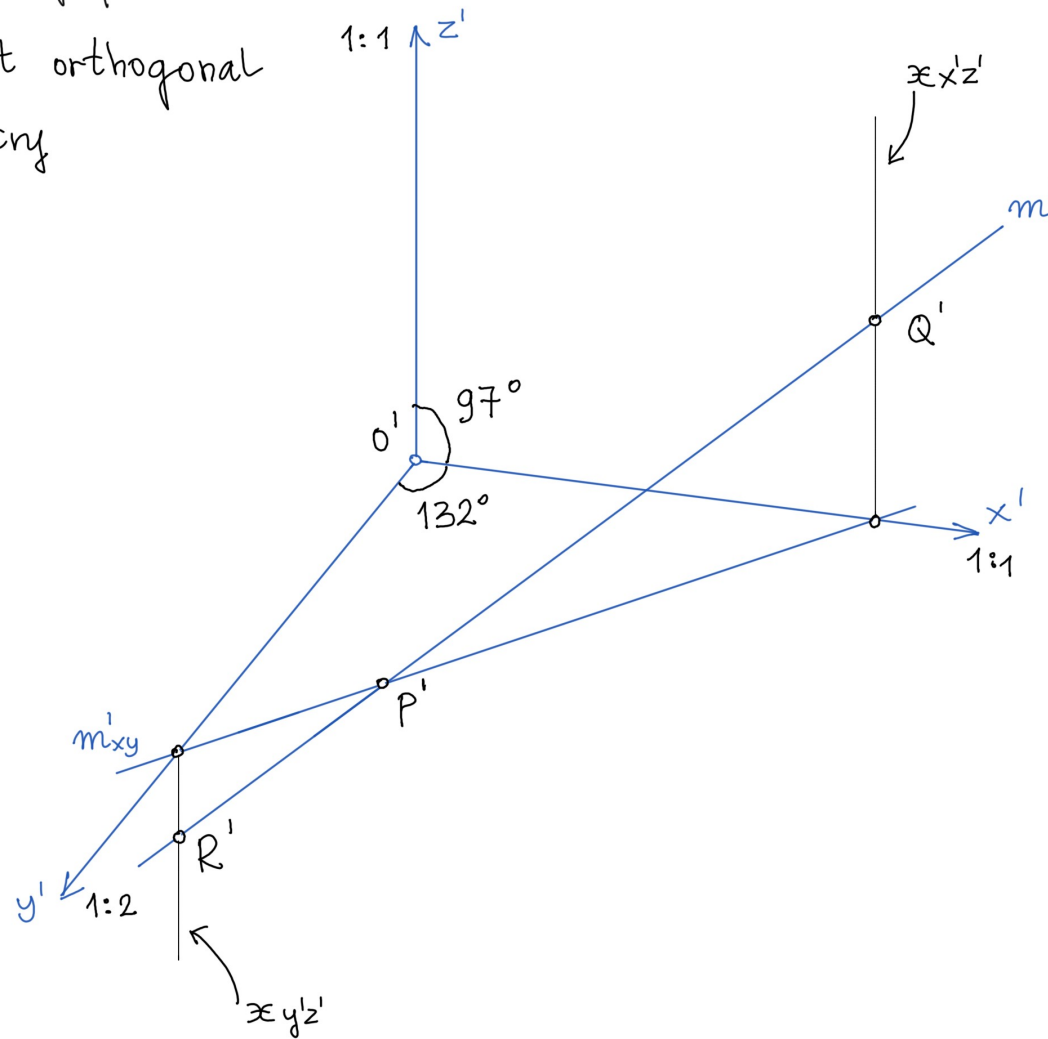
Find the triangle of shortenings at y.



? Draw the dimetries of a cube.

5. Piercing points

Almost orthogonal
dimetry



Given:

Axonometries of a line.

Problem:

Find the piercing points
of coordinate planes
by the line.

Solution:

$$P = m \cap m_{xy} \rightarrow P \in xy$$

$$Q \in xz$$

$$R \in yz$$