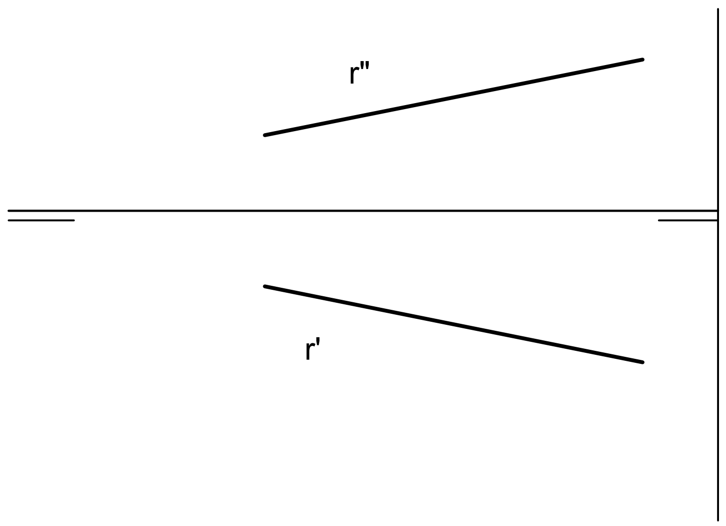
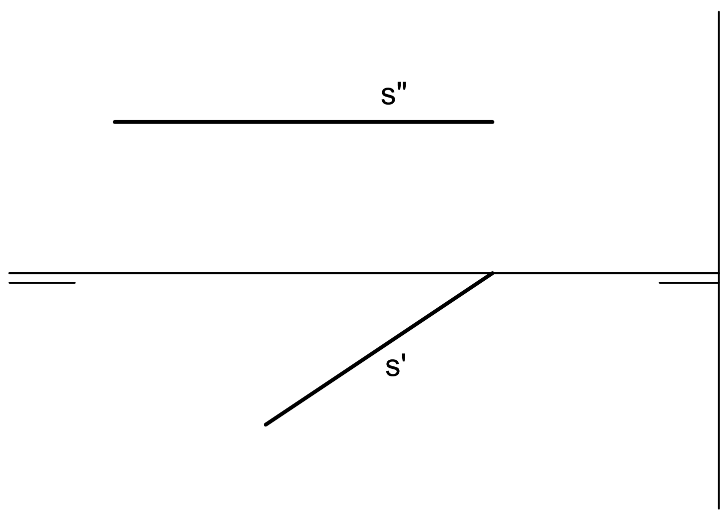
EXERCISE 1

Calculate the intersection between the lines $r: \begin{cases} x + 3y = 13 \\ y = z \end{cases}$ *and* $s: \begin{pmatrix} 3 \\ 0 \\ 2 \end{pmatrix} + \mu \begin{pmatrix} 3 \\ 2 \\ 0 \end{pmatrix}$ *and the planes XOY and XOZ.*

Find the traces of the lines r and s.





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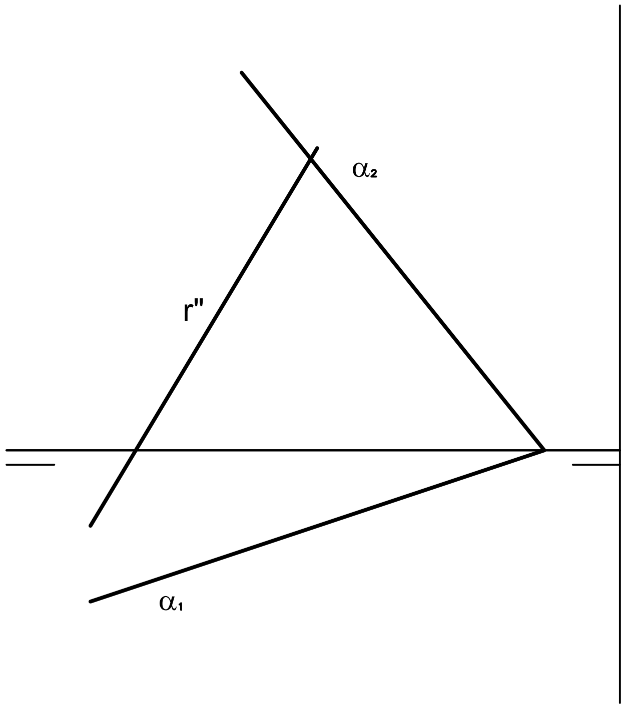
EXERCISE 2

Calculate the values of the real parameters a and b so that the plane $\alpha: 10x - 30y - 8z = 10$ contains the line that passes through the points $(4, a, 4)$ *and* $(7, b, -1)$.

Find the horizontal projection of the line r so that it is included in the plane α .

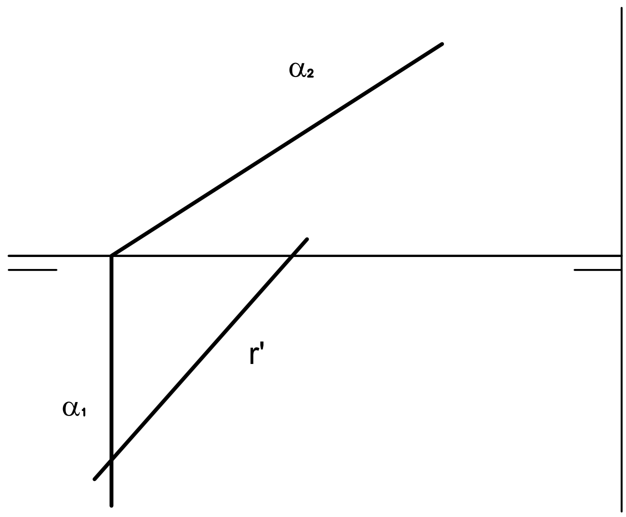


EXERCISE 3

Calculate the values of the parameters a *and* b *so that the plane that passes through the points* $P=(6,0,0)$, $Q=(2,0,2)$ *and* $R=(6,3,0)$ *contains the line*

$$r:\begin{cases} 3x-3y-12=0 \\ y(b-a)-3z+3a=0 \end{cases}.$$

Find the vertical projection of the line r so that it is included in the plane α .



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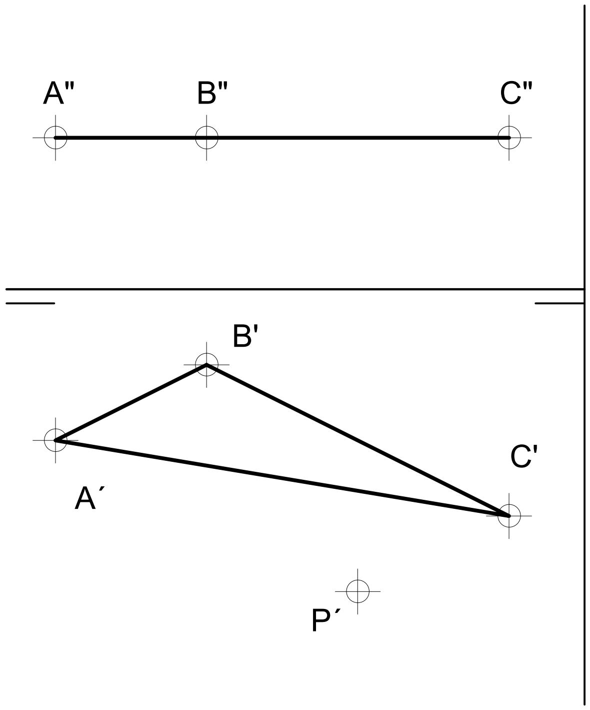
EXERCISE 4

Determine the coordinate z *so that the plane* α: $\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 6 \\ -1 \\ 0 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$

contains the point $P = (3,4,z)$.



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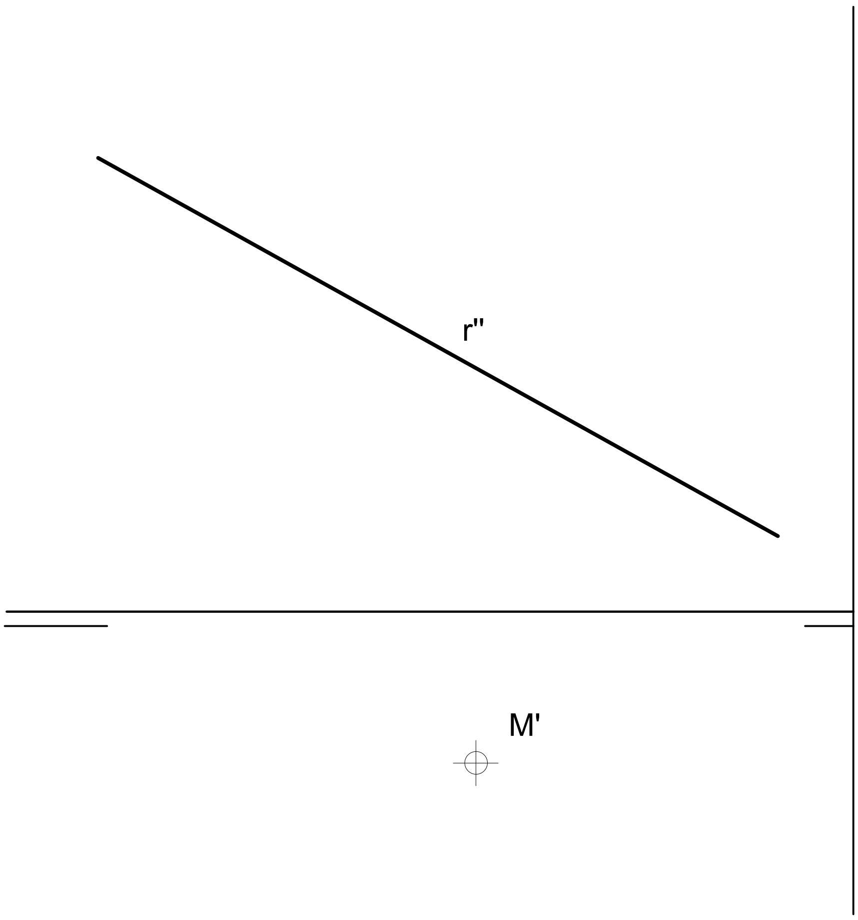
EXERCISE 5

Calculate the values of the parameters a *and* b *so that the line that passes through the points* $Q = (10, a, 6)$ *and* $R = (1, b, 1)$ *and the plane* XOZ *are parallel.*

1. *Determine the coordinate* z *so that the line* r *contains the point* $M =$ υȟςȟÚ 8
2. *Determine the coordinates* x *and* y *so that the line* r *contains the point P=(x,y,5).*

Find the vertical projection of the point M so that it is included in the line r. Find the horizontal projection of the line r so that it is parallel to the vertical projection plane. Find the projections of a point P with an elevation of 5, so that it is in the line r.



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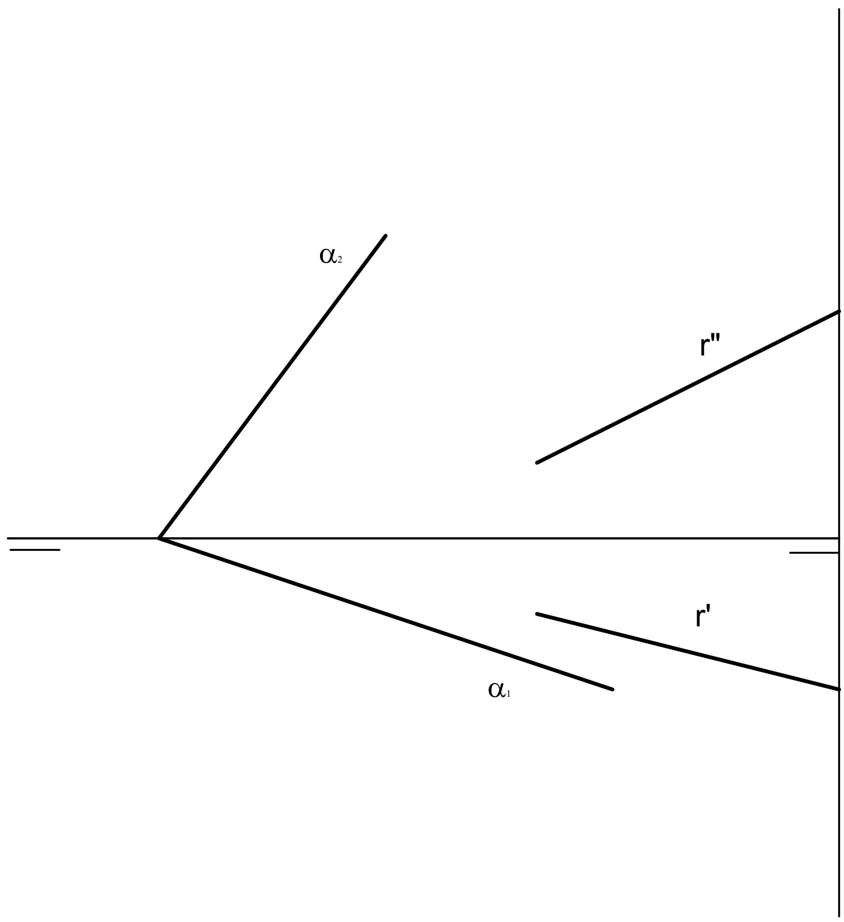
EXERCISE 6

Find the relative position of the line $r: \frac{x}{-4} = y - 2 = \frac{z-3}{2}$ and the plane α, being α the plane that passing through the point $P = (3,2,0)$ has as normal vector $\vec{n} = (4,12,3)$.

Define the relative position between the line r and the plane α.



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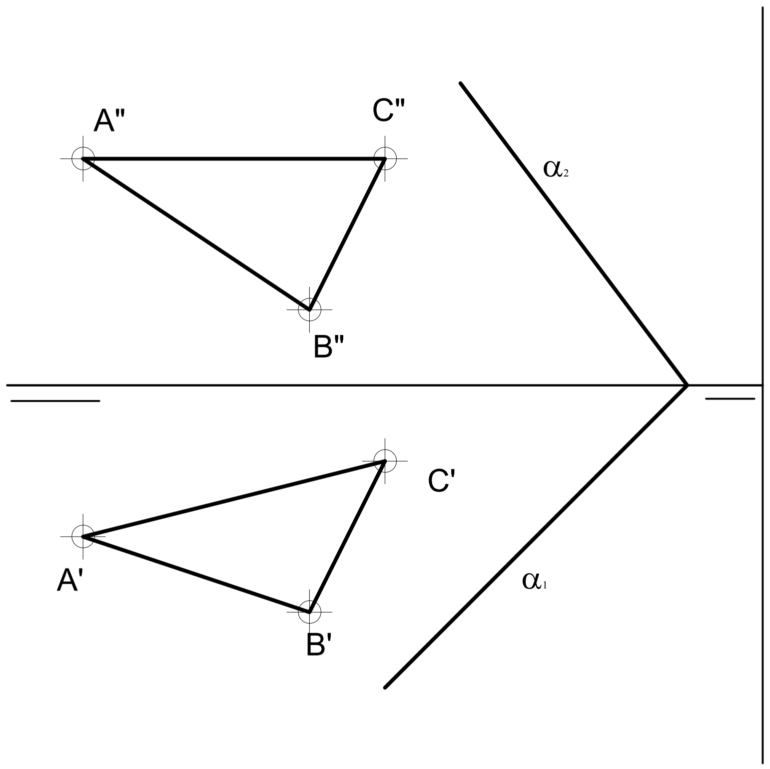
EXERCISE 7

Find the intersection between β, the plane that contains the points $A=(9,2,3)$, $B=(6,3,1)$ and $C=(5,1,3)$, and the plane $\alpha: 4x-4y-3z=4$.

Find the intersection between the planes ABC and α .



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Let be r the line that passes through the points $(13,3,3)$ and $(13,3,0)$, and s the one that passes through $(6,1,6)$ and $(1,1,1)$. Determine the lines that containing the point $P = (9,2,4)$ intersect the lines r and s.

Draw all the lines that contain the point P and intersect the lines r and s.