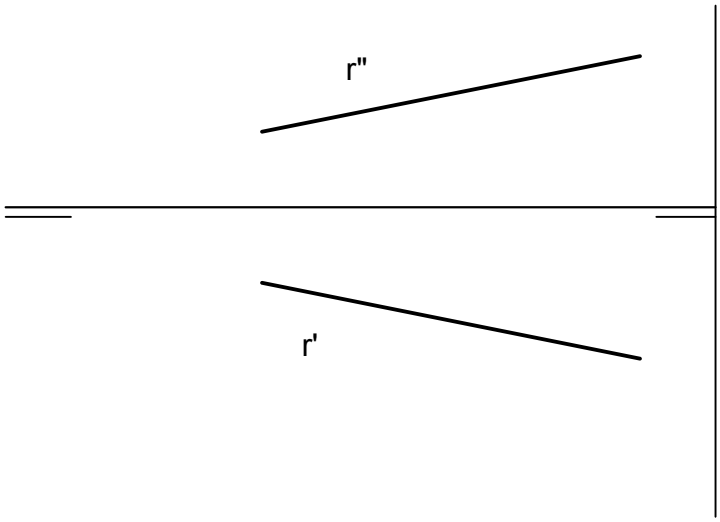
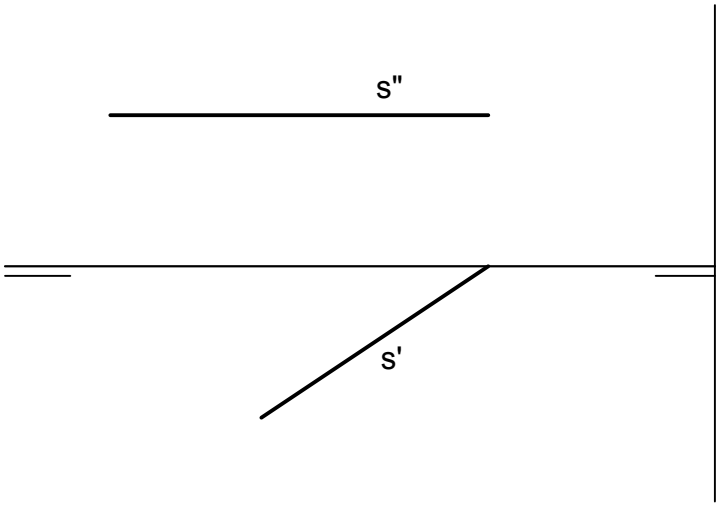
EXERCISE 1

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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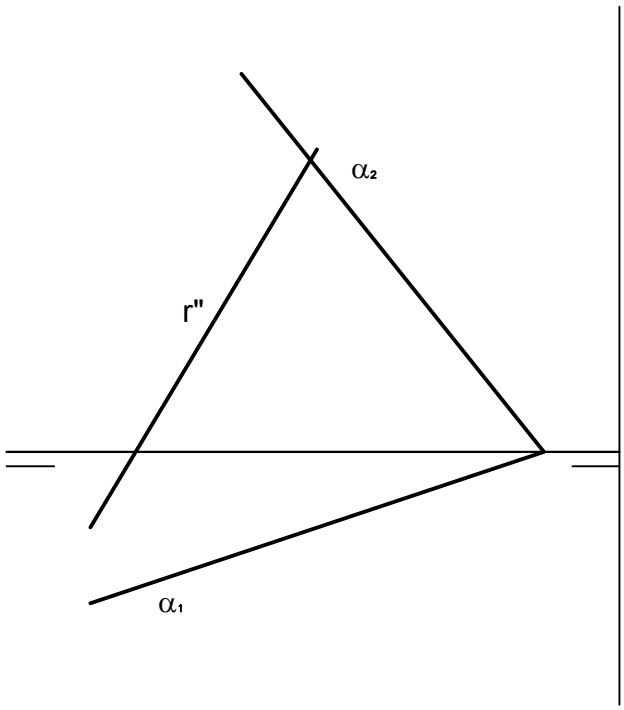
EXERCISE 2

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 .



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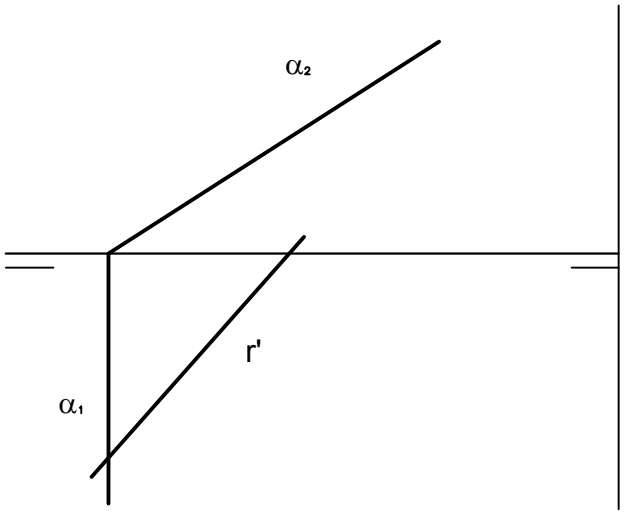
EXERCISE 3

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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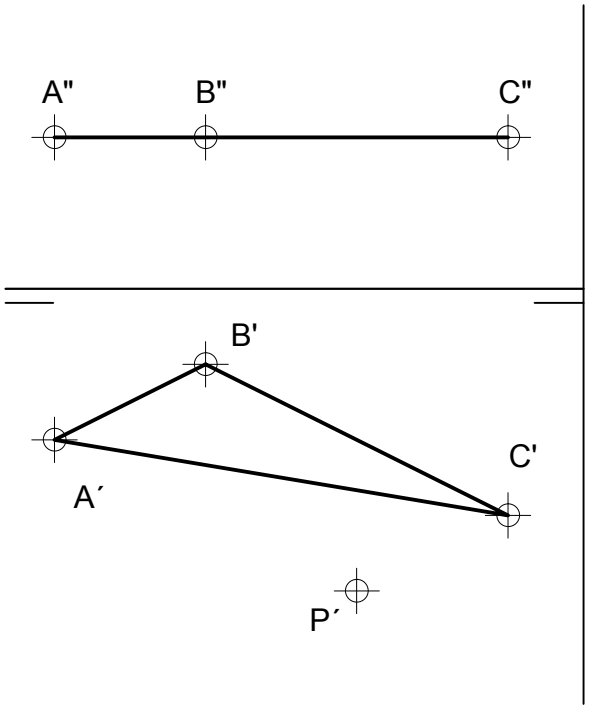
EXERCISE 4

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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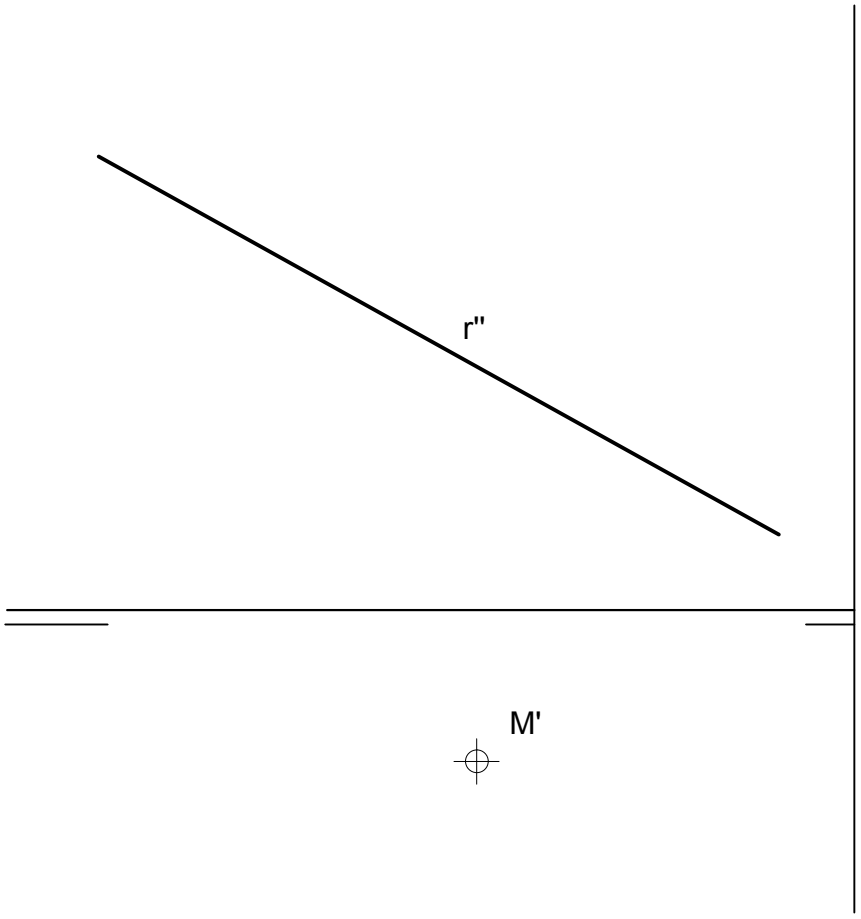
EXERCISE 5

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 $M =$ υ‖ç‖Ú ß*
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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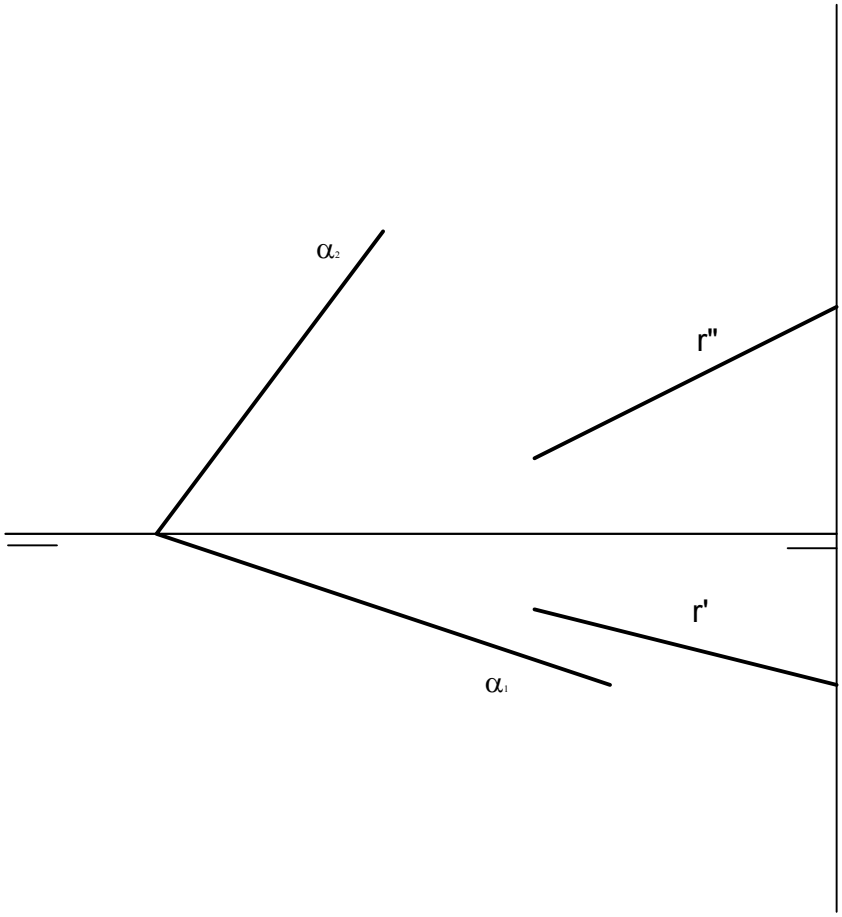
EXERCISE 6

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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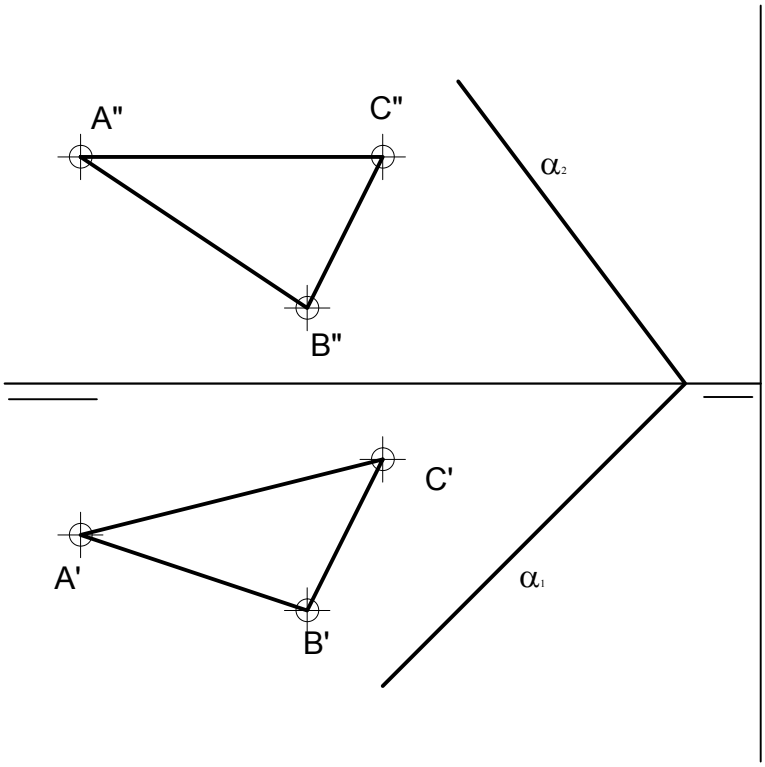
EXERCISE 7

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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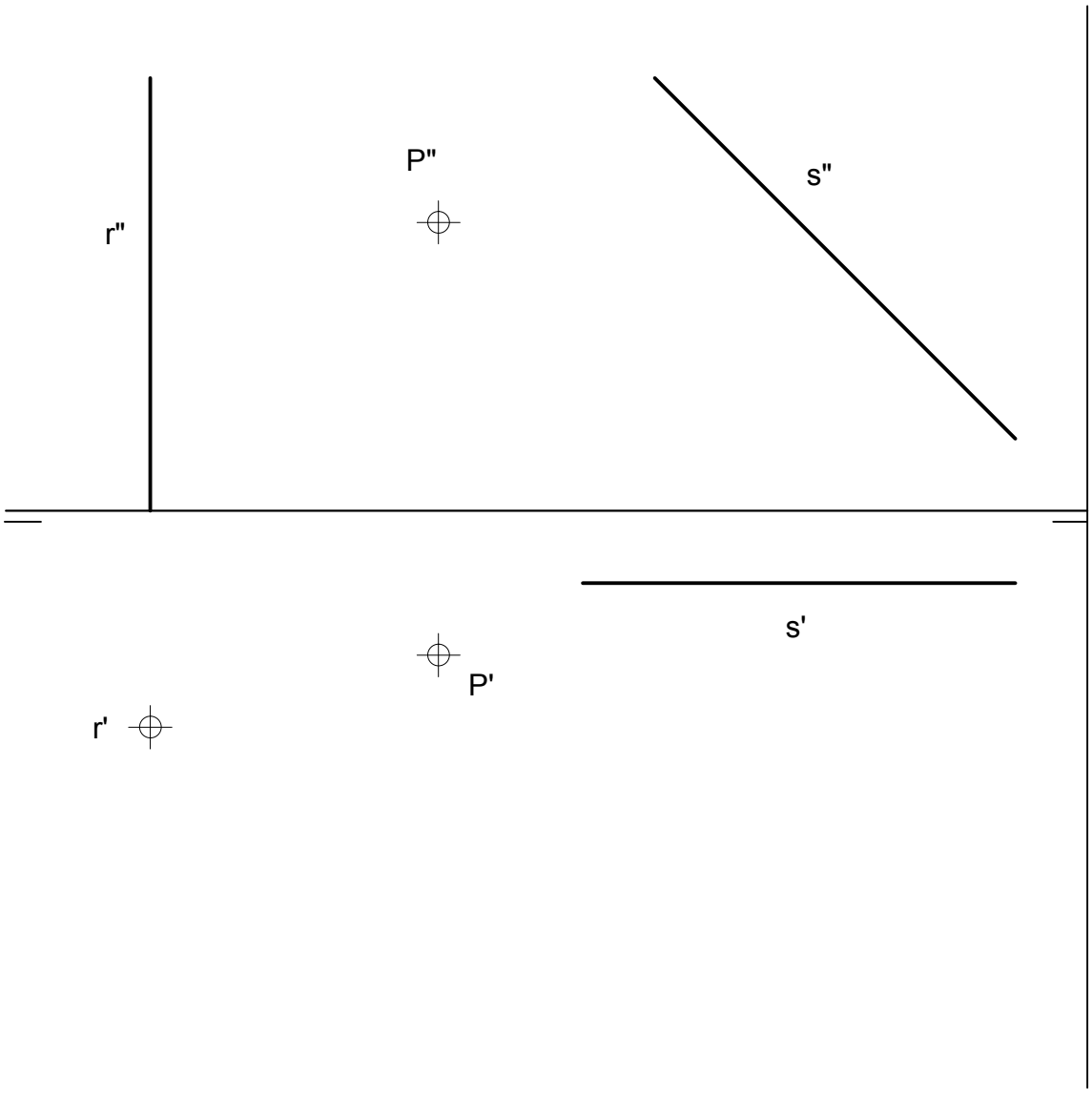
EXERCISE 8

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.



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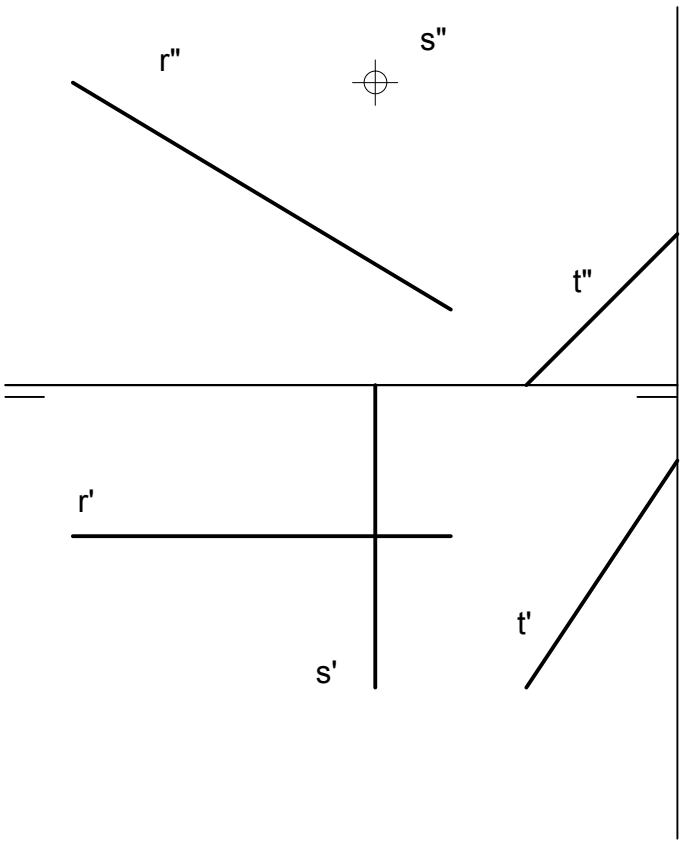
EXERCISE 9

Determine the lines that intersecting the lines r: $\begin{cases} 3x - 5y = 4 \\ y = 2 \end{cases}$ *and* s: $\begin{cases} x = 4 \\ z = 4 \end{cases}$ *are parallel to the line* t: $\frac{x}{2} = \frac{y-1}{3} = \frac{z-2}{-2}$.

Draw the lines that intersect the lines r and s and are parallel to the line t.



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