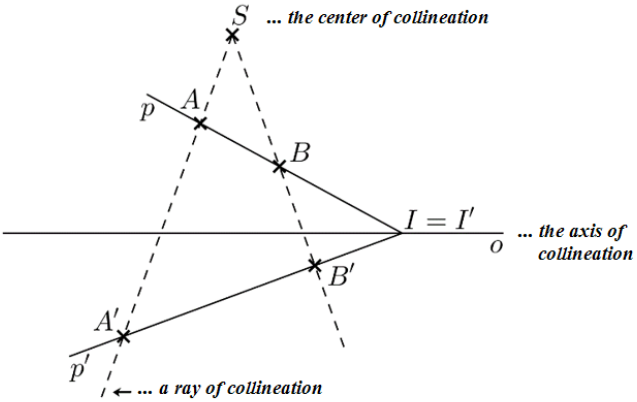
THE CENTRAL COLLINEATION



$A \leftrightarrow A'$ ... *a pair of corresponding points*
$p \leftrightarrow p'$ ... *a pair of corresponding lines*

$I = I'$ ... *self-conjugate point* ... The axis of collineation is the set of all self-conjugate points.

Basic properties of collineation:

$S \in AA'$ ... a pair of corresponding points lies on a ray of collineation passing through the center of collineation

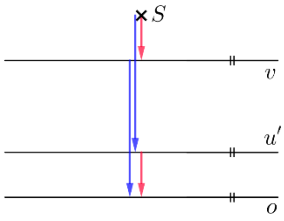
$(p \cap p') \in o$ ... a pair of corresponding lines intersects at a self-conjugate point on the axis

A ratio of division and a parallelism is not valid in this projection.

$U_\infty \in a \leftrightarrow U' \in a'$ ... U' ... a vanishing point of a line a
$V'_\infty \in a' \leftrightarrow V \in a$ ... V ... a vanishing point of a line a'

a vanishing line u' = the set of all vanishing points U'
a vanishing line v = the set of all vanishing points V

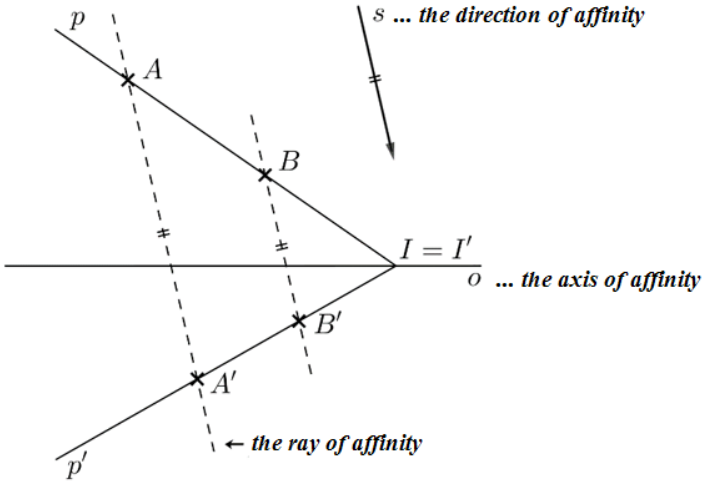
Lemma: The oriented distance from the center S to one vanishing line is equal to the oriented distance from the second vanishing line to the axis o.



The central collineation is determined:
KO $(S, o, A \leftrightarrow A')$ ... the center, the axis and a pair of corresponding points
KO $(S, o, p \leftrightarrow p')$ ... the center, the axis and a pair of corresponding lines
KO (S, o, u') ... the center, the axis and one vanishing line
KO $(S, A \leftrightarrow A', B \leftrightarrow B', C \leftrightarrow C')$ ... three pairs of corresponding points
(lines AA', BB', CC' intersect at the center S)

THE AXIAL AFFINITY

= a special case of collineation with an improper center S



$A \leftrightarrow A'$ *... a pair of corresponding points*
$p \leftrightarrow p'$ *... a pair of corresponding lines*

$I = I'$ ... a self-conjugate point

The axis of affinity is the set of all self-conjugate points.

Basic properties of affinity:

$AA' \parallel s$ ... A pair of corresponding points lies on a ray of collineation passing through the improper center of collineation (a line AA´ is parallel with the direction of affinity).

$(p \cap p') \in o$ ... A pair of corresponding lines intersects at a self-conjugate point on the axis.

A ratio of division (a center of a line segment is kept) and a parallelism is valid in this projection.

$s \perp o$ … the orthogonal affinity
$s \perp o$ … the oblique affinity

The affinity is determined:
AF $(o, A \leftrightarrow A')$ ... the axis and a pair of corresponding points
AF $(o, s, p \leftrightarrow p')$ ... the axis, the direction and a pair of corresponding lines
AF $(A \leftrightarrow A', B \leftrightarrow B', C \leftrightarrow C')$ ... three pairs of corresponding points $(AA' \parallel BB' \parallel CC')$