(1) (Problem □ 8.2.1)

Prove the converse of statement 17.

Every Harmonic Homology is a Period-2 Homology

Answer: A Period-2 Homology is a Homology h for which $h(h(X)) = X$ for every $X \in \mathbb{E}^2$. Consider a Harmonic Homology, h. Let points X and $h(X)$ be harmonic conjugates with respect to O and X_O, thus $H(Xh(X), OX_O)$. Note h determines a homology where O is the center and w is the axis such that, $X_O = w \cdot \overline{Xh(X)}$. Passing $h(X)$ through the collineation we get X, thus $h(h(X)) = X$ and h is order 2.

(2) (Art assignment)

Your Art/Math Project will be to complete the drawing of the photograph with the three other versions of the logo. You should turn in one "neat" copy of the drawing (with no construction lines); you should also turn in one or more drawings that show your constructions, clearly showing the center and axis that you use to construct the images. **Answer:**

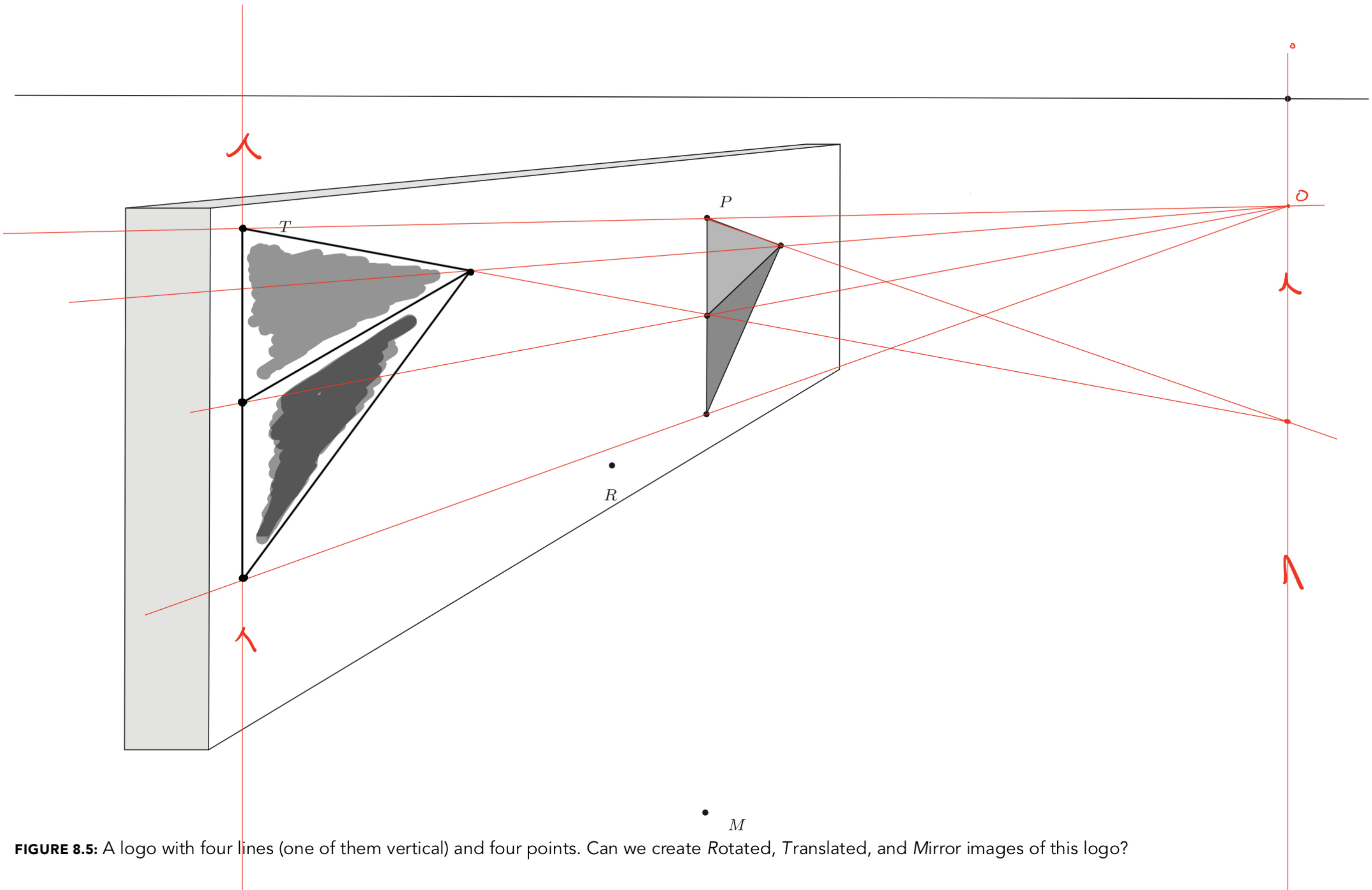
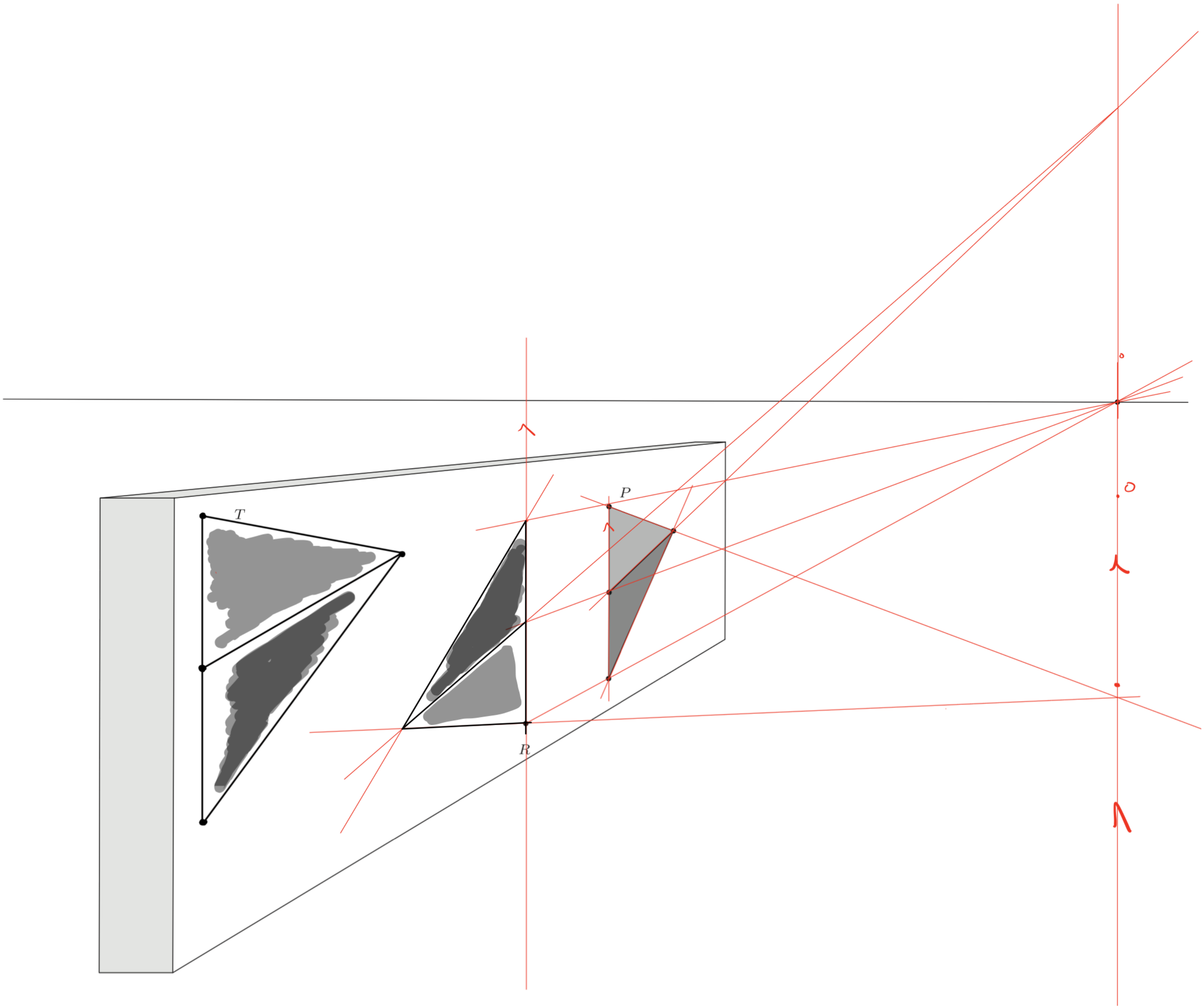
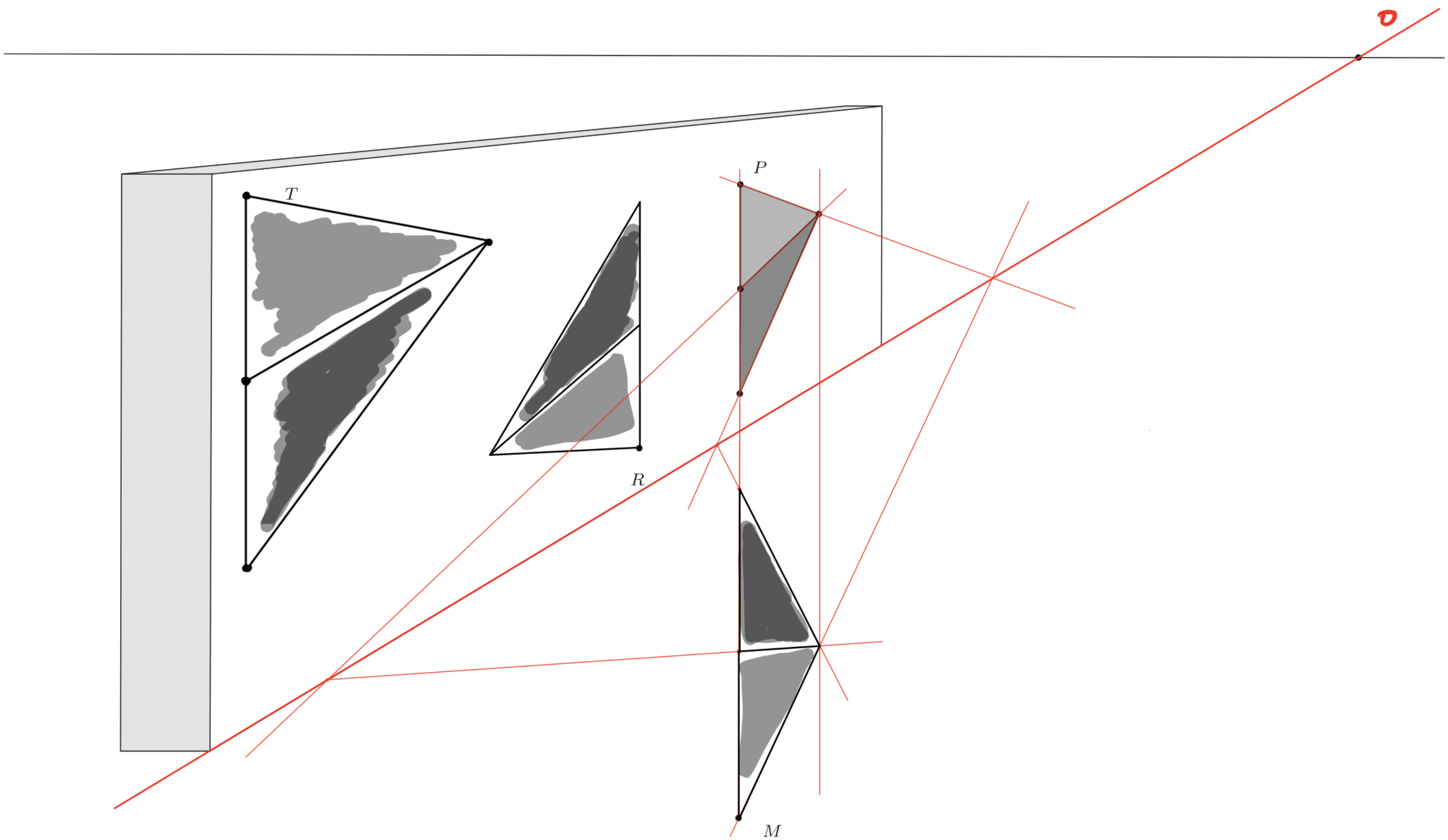


FIGURE 8.5: A logo with four lines (one of them vertical) and four points. Can we create *R*otated, *T*ranslated, and *M*irror images of this logo?


T
P
R



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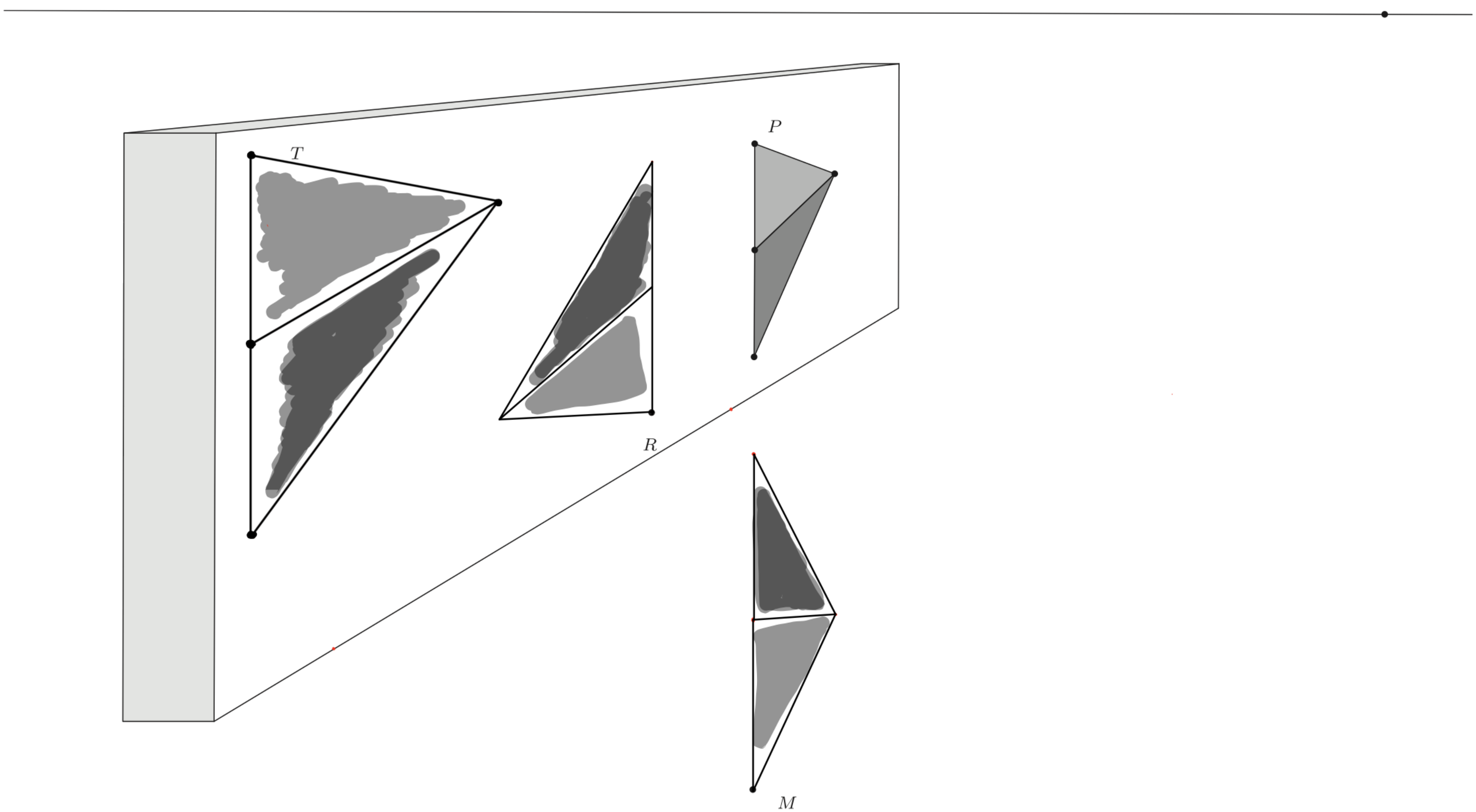

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