

ZMATH 2003b.01339

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Proof-analysis and the development of geometrical thought.

Hitt, Fernando, Representations and mathematics visualization. Cinvestav-IPN, Mexico (ISBN 968-5226-10-5). 337-368 (2002).

Mathematical demonstration cannot be a merely logical and thus tautological process and cannot consist in causal compulsion or reaction, but must rather be conceived of as a semiotic or representational process, because otherwise a paradox of proof arises (how can by means of demonstrations or proofs new knowledge be reached if these consist in merely reducing the new to the old and already known). The essential features of the activity of proving consist in seeing an A as a B, or representing A as B: $A=B$. Thus the 'equation' $A=B$ is constituted by resemblance or analogy. It is a representation or transformation, whose significance is in general merely analogical and open to failure. There is no necessity involved in this process, as Piaget believes, although Piaget's description of its stages, as intrafigural, interfigural and transfigural or structural are useful as an overall framework. This claim will be illustrated by means of an analysis and proof of the theorem about the 'Eulerline' of a triangle and its generalizations, finally demonstrating that this theorem is a special case of Desargues theorem.

Classification: E50