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On the psychology of mathematical problem solving by gifted students.

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Summary: This paper examines the nature of mathematical problem solving from a psychological viewpoint as a sequence of mental steps. The scope is limited to solution processes for well defined problems, for instance, which occur at International Mathematical Olympiads. First the meta-mathematical background is outlined in order to present problem solving as a well defined search problem and hence as a discovery process. Solving problems is described as a sequence of elementary steps of the so called “relationship-vision” introduced here. Finally, non-procedural aspects of the psychology of problem solving are summarized, such as the role of persistence, teacher-pupil relationship, the amount of experience needed, self-confidence and inspiration at competitions.

Classification: D50 C30 C20

Keywords: methodology of problem solving; psychology of problem solving; competitions; inspiration; intuition; heuristics; teaching; gifted pupils