

ZMATH 2016b.00581

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A square peg in a round hole.

Math. Sch. (Leicester) 39, No. 5, 11-13 (2010).

From the text: Which fits better, a square peg in a round hole or a round peg in a square hole? This style of problem is attractive. It's stated in very simple terms, slick even, but there's a good bit of mathematics behind the scenes waiting to be discovered. It exhibits some characteristics of a 'rich task'. It can certainly be extended in many different directions and to various levels of complexity and could be used as a starting point for an investigation or else prompt guided discovery activities to reveal many of the mathematical methods that students need to learn from KS3 upwards to university. You might argue, quite reasonably, that the question is not very well defined. What is the intended meaning? Well, this is what I want students to explore: Consider a square drawn inside a circle. What proportion of the circle's area is taken up by the square? Now consider a circle drawn inside a square. What proportion of the square's area is taken up by the circle? And hence, which fits the better?

Classification: G40 G60 G70 D50

Keywords: plane geometry; area; circles; squares; proportion; Pythagorean theorem; nesting; ratio; equal excess and defect; trigonometry; coordinate geometry; straight line; analytic geometry; rich task; non-routine problems; open-ended problems