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An Archimedean balance: polygons on the head of a pin.
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From the text: Archimedes's famous exposition "Mechanical Method", in which he provides the "mechanical" derivation of the area formula for a parabolic sector, is one of the great pieces of mathematical literature. Since reading this exposition years ago, I have been intrigued by the potential interplay between pure mathematical theorems and physical properties. The traditional relationship between the two is to have mathematics describe and justify physical truths, which usually happens in physics class. But at times the process is reversed – that is, physical truths can be used as postulates to derive mathematical ones. I will illustrate this phenomenon with a small example of similar reasoning, showing its accessibility to high school students and its place in a mathematics classroom. Years before I read Archimedes's derivation, I became fascinated by the purely mathematical properties of special points in triangles, but I was only mildly interested to learn that the centroid is a triangle's balancing point, the point at which a uniformly thick and dense triangle would balance on a pin (a key fact in Archimedes's parabolic sector derivation). But now the idea intrigued me. I wondered, How can we logically justify its truth? And how can we deduce the location of the balancing point for a more complicated polygon?

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http://www.nctm.org/Publications/mathematics-teacher/2013/Vol107/Issue4/Delving-Deeper_-An-Archimedean-Balance_-Polygons-on-the-Head-of-a-Pin/