

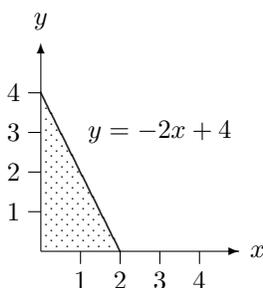
The Centroid

Dr. Zee, the intrepid explorer, was in his garage making the final preparations for his journey into Flatland¹. “I wonder where the hook should be placed on this ship,” said Dr. Zee. “We’ll use the crane to lower the ship into Flatland, but as everyone knows, unless the ship is perfectly horizontal when it arrives in Flatland, it will pass right through without stopping.”

“Well,” suggested his talented assistant, “the ship has the shape of a triangle. Perhaps we could locate the centroid and...”

“I’ve got it!” shrieked Dr. Zee, “We’ll attach the hook precisely at the centroid!” Quickly, Dr. Zee sketched the following diagram in the dust on the garage floor.

Dr. Zee’s Triangular Ship



“The equation of the line joining the points (0,4) and (2,0) is $y = -2x + 4$,” continued Dr. Zee as his assistant listened attentively. “The mass and moments are given by

$$M = \int_0^2 (-2x + 4) dx = 4,$$

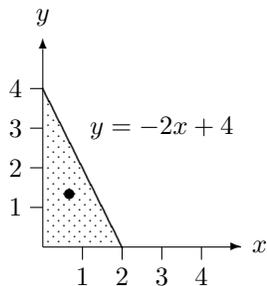
$$M_x = \int_0^2 \frac{(-2x + 4)^2}{2} dx = \frac{16}{3},$$

and

$$M_y = \int_0^2 x(-2x + 4) dx = \frac{8}{3}.”$$

“Consequently, the centroid is located at the point $\left(\frac{M_y}{M}, \frac{M_x}{M}\right) = \left(\frac{2}{3}, \frac{4}{3}\right)$.” “Get the flat welding rod,” concluded Dr. Zee. “We’ll place the hook at the point $\left(\frac{2}{3}, \frac{4}{3}\right)$.”

Dr. Zee’s Triangular Ship with Centroid Shown



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¹Flatland, by Edwin Abbott