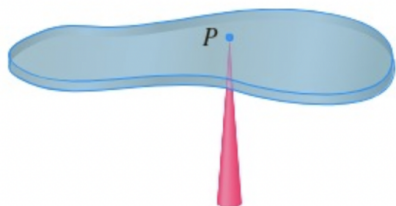


M16600 Lecture Notes

Section 8.3: Center of Mass of Centroid

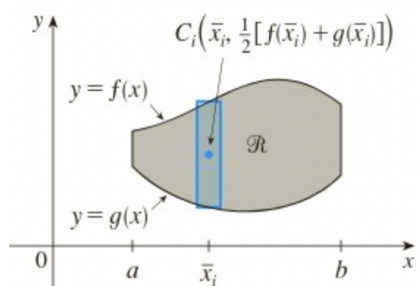
■ Section 8.3 textbook exercises, page 595: # 29, 30, 32.



Our main objective here is to find the point P on which a thin plate of any given shape balance horizontally as in the figure on the left. This point is called the **center of mass** of the plate (or the **centroid** of the plate).

We consider a flat plate (called *lamina*) that occupies a region \mathcal{R} of the xy -plane.

The center of mass of the region \mathcal{R} is located at the point (\bar{x}, \bar{y}) , where



$$\bar{x} = \frac{1}{A} \int_a^b x [f(x) - g(x)] dx$$

$$\bar{y} = \frac{1}{A} \int_a^b \frac{1}{2} \left([f(x)]^2 - [g(x)]^2 \right) dx$$

Here A is the area of the region \mathcal{R} .

See the discussion on page 600-603 of the textbook for more detail

Example: Find the centroid of the region bounded by the line $y = x$ and the parabola $y = x^2$.