Centroid evaluation algorithm of a polygonal area implemented in python

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Introduction
There is a method to evaluate the area of a polygon by dividing it into triangles.
If the coordinates of each vertex of the polygon are known, the area of each triangle that integrates it.
Assuming the first vertex as coordinates 0,0 would be given by the following equation
A(j)=1/2(x(j)y(j+1)-x(j+1)y(j))
However, each triangle must be added with the others to evaluate the total area.
By definition the centroid would correspond to coordinates that correspond to the center of gravity of the polygon.
By definition the position of the centroid is given by

$$Cx = \frac{\left(\sum My\right)}{\left(Atotal\right)}$$
$$Cy = \frac{\left(\sum Mx\right)}{\left(Atotal\right)}$$

Where summation My is the sum of the Moments with respect to the y-axis. If the area is divided into triangles the moment with respect to y would be given by the sum of products of each triangular area by the x-coordinate of the centroid of each individual triangle.
The summation Mx is the sum of the moments with respect to the x-axis. Using triangles one would have to calculate the individual moment of each triangle by multiplying the area of the triangle by the y-coordinate of its respective centroid.

Demonstration of the formula for the individual area of the triangle

by definition the area of a triangle is equal to half the area of the base times the height.
if two coordinates of the polygon are known and the coordinates 0,0 are taken as the original vertex, there are 3 coordinates that form a triangle to calculate the area of the triangle, since the base does not coincide with the x-axis, it is divided into two triangles according to the following figure