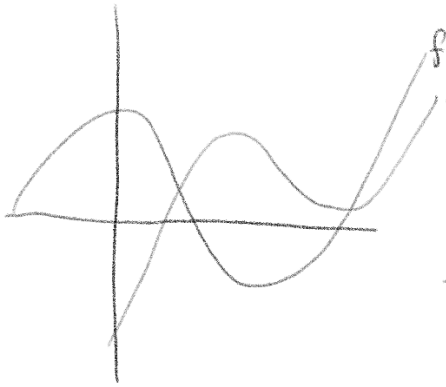
"We often hear that mathematics consists mainly of proving theorems. Is a writer's job mainly that of writing sentences?"

Gian-Carlo Rota.

A common problem where integration comes up is in computing the average of a continuous variable.

Given some function $f(x)$.



$f(x)$ ⇒ describes the rate of change

$F(x)$ ⇒ describes the area / the sum of $f(x)$ values.

The average of $f(x)$'s values is
- the average
- or, the averaged rate of change.

The integral describes the

aggregate sum due to the rate of change. The aggregate is conditioned by the rate of change

Calculating the average rate of change is a simple as calculating the aggregate of that change and then working out the average rate of change required to reach that aggregate.

That is the relationship between area and slope.