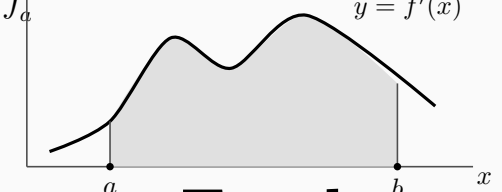
$\partial[a,b] = \{a,b\}$

integral over interior $\mapsto$ difference on boundary

Fundamental Theorem of Calculus

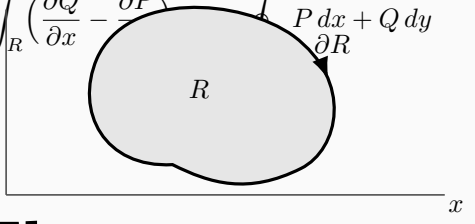
$$\int_a^b f'(x)\,dx = f(b) - f(a)$$



Area integral $\longleftrightarrow$ circulation on boundary

Green's Theorem (Planar)

$$\iint_R \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y}\right) dA = \oint_{\partial R} P\,dx + Q\,dy$$



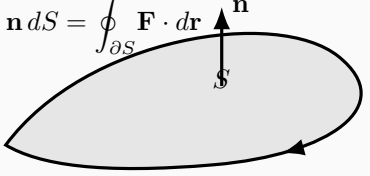
Fundamental Theorems

(Boundary $\leftrightarrow$ Interior)

Flux of curl through surface $\longleftrightarrow$ line integral on boundary

Stokes' Theorem (Surface)

$$\iint_S (\nabla \times \mathbf{F}) \cdot \mathbf{n}\,dS = \oint_{\partial S} \mathbf{F} \cdot d\mathbf{r}$$



Divergence over volume $\longleftrightarrow$ flux through boundary

Divergence Theorem (Volume)

$$\iiint_V (\nabla \cdot \mathbf{F})\,dV = \oint_{\partial V} \mathbf{F} \cdot \mathbf{n}\,dS$$