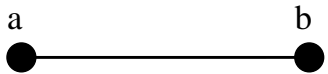


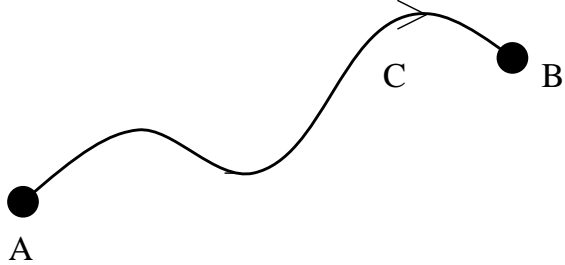
# THE FUNDAMENTAL THEOREM OF CALCULUS THE FIRST FIVE VERSIONS

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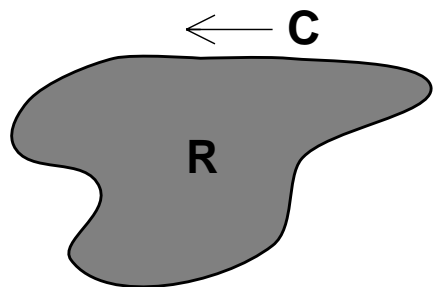
$$\int_a^b f'(x) dx = f(b) - f(a) \quad (\text{Barrow-Newton-Leibniz})$$
 (ambient dimension 1)

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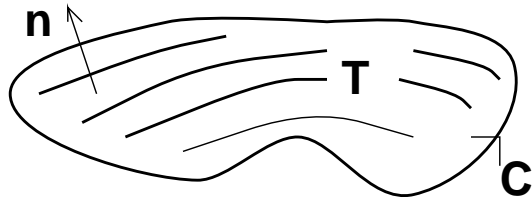
$$\int_C \nabla f \cdot d\mathbf{x} = f(B) - f(A)$$
 (ambient dimension 2 or 3)

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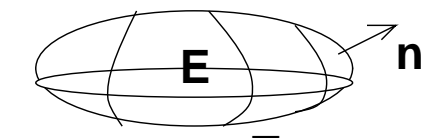
$$\iint_R \left( \frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dA = \int_C P dx + Q dy \quad (\text{Green})$$
 (ambient dimension 2)

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$$\iint_T \text{curl } \mathbf{F} \cdot \mathbf{n} dS = \int_C \mathbf{F} \cdot d\mathbf{r} \quad (\text{Stokes})$$
 (ambient dimension 3)

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$$\iiint_E \text{div } \mathbf{F} dV = \iint_T \mathbf{F} \cdot \mathbf{n} dS \quad (\text{Gauss})$$
 boundary surface: **T**  
 (ambient dimension 3)

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etc., etc. (!?)