# Integration by parts

MATH 1700

# Readings

**Readings**: Section 7.1

# Integration by parts: indefinite integrals

Integration by parts is the reverse of the product rule.

**Integration by parts, function notation**: if *f* and *g* are differentiable functions then

$$\int f(x)g'(x)dx = f(x)g(x) - \int f'(x)g(x)dx$$

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**Integration by parts, Leibniz notation**: Setting $u = f(x)$, $v = g(x)$ we have

$$\int u\,dv = uv - \int v\,du.$$

# Integration by parts: definite integrals

If *f* and *g* are differentiable functions then

$$\int_a^b f(x)g'(x)dx = f(x)g(x)\Big|_a^b - \int_a^b g(x)f'(x)dx.$$