

MATH 130A Review: Integration by parts

1. Calculate $\int_0^1 x e^{3x} dx$

Solution:

$$(x)(\tfrac{1}{3}e^{3x})\Big|_0^1 - \int_0^1 (\tfrac{1}{3}e^{3x}) d(x) = \tfrac{1}{3}e^3 - (\tfrac{1}{9}e^3 - \tfrac{1}{9}) = \tfrac{2}{9}e^3 + \tfrac{1}{9}$$

2. Calculate $\int_1^2 \ln(x) dx$

Solution:

$$(\ln(x))(x)\Big|_1^2 - \int_1^2 (x) d(\ln(x)) = 2\ln(2) - (2 - 1) = 2\ln(2) - 1$$