

## Math 102 — Integration by substitution

---

**Problem 1.** Find the following antiderivatives using  $u$ -substitution. Begin by identifying  $u$  and compute  $du = u'(x) dx$ .

a.  $\int e^{-4x} dx$

b.  $\int \sin(2x) dx$

c.  $\int x^2 e^{x^3+1} dx$

d.  $\int x(x^2 + 3)^2 dx$

e.  $\int \tan x dx$

f.  $\int 2x(x + 1)^{1/3} dx$