

Math 101 – WORKSHEET 10
INTEGRATION BY PARTS

(1) Evaluate the following integrals:

(a) $\int x^2 \cos x \, dx$

(b) $\int \log x \, dx$

(c) (Final, 2013) $\int_0^1 \arctan x \, dx =$

(2) Now let's play with our toolkit

(a) Evaluate $\int \frac{\log x}{x} dx$

(b) (Quiz 2015) Evaluate $\int \frac{\log x}{x^3} dx$

(c) (Final, 2010) Let $g(x) = \int_0^1 (xe^t - t)^2 dt$. Find the minimum value of $g(x)$.

(d) Evaluate $\int x^3 \log(x^2 + 1) dx$