Practice Problems: Integration by Parts

Written by Victoria Kala vtkala@math.ucsb.edu November 9, 2014

This is a list of practice problems for Math 3B. Feel free to work with a group on any problem. These problems are intended to enhance your knowledge and give you something to bring a boring party back to life.

- 1. $\int e^x \sin x dx$
- 2. $\int (\sin^{-1} x)^2 dx$
- 3. $\int x \tan^2 x dx$
- 4. $\int_0^1 t \cosh t dt$
- 5. $\int z^3 e^z dx$
- 6. $\int_{1}^{\sqrt{3}} \arctan(1/x) dx$
- 7. $\int \cos x \ln (\sin x) dx$

8.
$$\int_{1}^{2} \frac{(\ln x)^2}{x^3} dx$$

9. $\int \cos \sqrt{x} dx$

10.
$$\int_{\sqrt{\pi/2}}^{\sqrt{\pi}} \theta^3 \cos(\theta^2) dx$$

- 11. $\int x \ln(1+x) dx$
- 12. $\int \sin(\ln x) dx$
- 13. $\int x^3 \sqrt{1+x^2} dx$
- 14. Find the area between the given curves: $y = x^2 \ln x$, $y = 4 \ln x$
- 15. Use the method of cylindrical shells to the find the volume generated by rotating the region bounded by the given curves about the specified axis: $y = e^{-x}$, y = 0, x = -1, x = 0 about x = 1.