# Homework #2
# Due: Tuesday, February 8, 2011

Compute the following integrals.
**Note**: Use of Matlab (or any other software) is not permitted.

1. $\int_0^\infty \frac{1}{x^2+1}\,dx$

2. $\int_{-\infty}^\infty \frac{1}{x^2+a^2}\,dx$ , for a fixed real parameter $a>0$

3. $\int_{-\infty}^\infty \frac{1}{(x^2+1)(x^2+a^2)}\,dx$ , for a fixed real parameter $a>0$

4. $\int_0^\infty e^{-ax}\,dx$ , for a fixed real parameter $a>0$

5. $\int_0^\infty e^{-x}x^2\,dx$

6. $\int_0^\infty e^{-x}x^n\,dx$ , for some fixed integer $n>0$.

7. $\int_0^\infty e^{-x}\cos(\omega x)\,dx$ , for some fixed real parameter ω

8. $\int_0^\infty e^{-x}\sin(\omega x)\,dx$ , for some fixed real parameter ω

9. $\int_0^\infty e^{-x-i\omega x}\,dx$ , for some fixed real parameter ω

10. $\int_{-\infty}^\infty e^{-|x|-i\omega x}\,dx$ , for some fixed real parameter ω

11. (Bonus Question: replaces any single one of the above) $\int_{-\infty}^\infty e^{-x^2}\,dx$

*Total*: 10 pts (1 point each)