

Worksheet 2

Spring 2016

MATH 222, Week 2: I.6,I.8,I.10

Name: _____

Problem 1. Compute $\int x \ln(x) dx$.

Problem 2. (a) Compute $\int_0^\pi \cos(x) dx$ and $\int_0^\pi x^2 \cos(x) dx$

(b) Show that:

$$\int x^n \cos(x) dx = x^n \sin(x) + nx^{n-1} \cos(x) - n(n-1) \int x^{n-2} \cos(x) dx$$

(Hint: The steps are very similar to what you did in part (a) for $\int_0^\pi x^2 \cos(x) dx$).

(c) Use the identity you just proved and part (a) to compute $\int_0^\pi x^4 \cos(x) \, dx$.

Problem 3. Compute $\int x^7 \sin(2x^4) \, dx$.

Problem 4. Compute $\int \frac{1}{x^2-4} \, dx$

Problem 5. Compute $\int \frac{x^3}{x^2+2} \, dx$

Problem 6. Compute $\int \frac{1}{2+e^{2i}} \, dt$