

HOMEWORK 7, DUE FRIDAY, APRIL 23

Please turn in solutions for the following problems:

- Compute each real integral using complex integration techniques:

$$(1) \int_{-\infty}^{\infty} \frac{1}{x^6 + 1} dx$$

$$(2) \int_{-\infty}^{\infty} \frac{x^2}{(x^2 + 4)(x^2 + 9)} dx$$

$$(3) \int_{-\infty}^{\infty} \frac{x \sin(x)}{x^2 + 4} dx$$

$$(4) \int_{-\infty}^{\infty} \frac{\cos(4x)}{(x^2 + 1)^2} dx$$

$$(5) \int_{-\infty}^{\infty} \frac{x^2 \cos(x)}{(x^2 + 1)(x^2 + 16)} dx$$

$$(6) \int_0^{\infty} \frac{\sqrt{x}}{(x^2 + 1)^2} dx$$

$$(7) \int_0^{2\pi} \frac{2}{\cos(x) + 2} dx$$

$$(8) \int_0^{2\pi} \frac{1}{5 + 4 \sin(x)} dx$$

In addition, I suggest that you work these problems from the Brown/Churchill textbook (but do not turn in):

- Page 267, problems 1, 2, 3, 4, 5, 6, 7
- Pages 275-276, problems 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
- Pages 286-287, problems 1, 2, 3, 4, 5, 6
- Page 290-291, problems 1, 2, 3, 4, 5, 6, 7