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Math 185, summer 2005

Homework 12
Due 8/9/05

Problems 1-8: X.11.2, X.12.5, X.12.7, X.16.1, X.16.2, X.16.4, X.17.2, X.17.3.

Problem 9: Show that

$$\int_0^\infty \frac{\sin^3 x}{x^3}\,dx = \frac{3\pi}{8}$$

Hints: Use de Moivre's theorem and/o some trig identities to show that $\sin^3 x = \frac{3}{4}\sin x - \frac{1}{4}\sin 3x$. Then integrate

$$\frac{\frac{3}{4}e^{iz} - \frac{1}{4}e^{3iz}}{z^3}$$

around the contour shown on p. 122. The hard part is aping the argument on p. 124.