Calculus II
Homework on Lecture 6

1. Integrate.

   (a) $\int \frac{1}{3+\cos x}\mathrm{d}x.$

   (b) $\int \frac{1}{4+\cos x}\mathrm{d}x.$

   (c) $\int \frac{1}{3+\sin x}\mathrm{d}x.$

   (d) $\int \frac{1}{2+\tan x}\mathrm{d}x.$ (Hint: this integral can be done simply with the substitution $x = \arctan t$.)

   (e) $\int \frac{\mathrm{d}x}{2\sin x - \cos x + 5}.$

2. Integrate. The answer key has not been proofread, use with caution.

   (a) $\int \sin(3x)\cos(2x)\mathrm{d}x.$

   (b) $\int \sin x \cos(5x)\mathrm{d}x.$

   (c) $\int \cos(3x)\sin(2x)\mathrm{d}x.$

   (d) $\int \sin(5x)\sin(3x)\mathrm{d}x.$

   (e) $\int \cos(x)\cos(3x)\mathrm{d}x.$

3. Integrate.

   (a) $\int \sin^2 x \cos x \mathrm{d}x.$

   (b) $\int \sin^2 x \mathrm{d}x.$

   (c) $\int \cos^3 x \mathrm{d}x.$

   (d) $\int \sin^3 x \cos^4 x \mathrm{d}x.$

4. Integrate.

   (a) $\int \sec x \mathrm{d}x.$

   (b) $\int \sec^3 x \mathrm{d}x.$

   (c) $\int \tan^3 x \mathrm{d}x.$

   (d) $\int \sec^2 x \tan^2 x \mathrm{d}x.$