

**Instructions:** Your homework is in two parts, which you should turn in separately. This is **not** the same as the week 6 course packet homework: it is shorter. In particular, it is missing problems 3 and 4 (all of the problems from section 7.7 plus a problem involving  $\tan^{-1} x$  and Simpson's rule).

**Due Wednesday, November 8, in lecture.**

**Week 6 Homework Problems, part A**

1 Stewart, section 7.4: #1, 8, 9, 13, 17, 21, 32, 39, 42, 63

2 Stewart, section 7.5: #1, 4, 7, 9, 14, 17, 23, 32

**Week 6 Homework Problems, part B**

5 Solve the following integrals.

a)  $\int x\sqrt{x^2 + 1} dx$

g)  $\int_0^5 \sqrt{25 - x^2} dx$

b)  $\int_0^4 e^{-\sqrt{x}} dx$

h)  $\int_0^5 |x - 2| dx$

c)  $\int_0^1 \frac{5}{\sqrt{4 - x^2}} dx$

i)  $\int_0^4 |x^2 - 6x + 8| dx$

d)  $\int x\sqrt{5 - x} dx$

j)  $\int \cos^3 y \sin^2 y dy$

e)  $\int_1^8 \frac{1}{x + x^{1/3}} dx$  (difficult)

k)  $\int_1^3 (xf(x^2) + 3f(x) + 5) dx$ , given that  
 $\int_1^3 f(x) dx = 7$ ,  $\int_3^{11} f(x) dx = 13$ , and

f)  $\int \sec^2(7x) \tan^4(7x) dx$

$\int_9^{11} f(x) dx = 6$

6 For each of these integrals, decide which method you think will work best on the integral. **Do not compute** the integral.

a)  $\int \frac{4}{x^2 - 25} dx$

f)  $\int_0^1 \frac{4x + 12}{x^2 + 6x - 9} dx$

k)  $\int_1^2 \ln(3x) dx$

b)  $\int \frac{4}{\sqrt{x^2 - 25}} dx$

g)  $\int_1^4 \cos^3 x \sin^2 x dx$

l)  $\int_2^4 \frac{5}{x \ln x} dx$

c)  $\int x^2 \sin(3x) dx$

h)  $\int_0^1 \frac{5}{x^2 + 5x - 14} dx$

m)  $\int_1^4 \frac{3}{(x^2 + 2)^{3/2}} dx$

d)  $\int_1^4 \tan^3 x \sec^2 x dx$

i)  $\int_0^2 x\sqrt{5 - x^2} dx$

n)  $\int_0^5 |x - 3| dx$

e)  $\int_0^1 \sin(\sqrt{x}) dx$

j)  $\int_1^4 \frac{\sin(\ln x)}{x} dx$

7 The following problems are optional. **Do not hand them in.** They are intended to help you study.

a)  $\int \frac{\sin x}{1 - \cos^2 x} dx$

b)  $\int e^{2x} \sin(3x) dx$

c)  $\int_1^4 \frac{z^2 + z + 1}{\sqrt{z}} dz$

d)  $\int \frac{\sin(\pi\sqrt{t})}{\sqrt{t}} dt$

e)  $\int_1^2 \frac{x + 4}{x^2 + 8x} dx$

f)  $\int_{-3}^3 \sqrt{9 - x^2} dx$

g)  $\int \frac{1 + \ln y}{y} dy$

h)  $\int x \cos(7x) dx$

i)  $\int \frac{6x^3 + 4x + 3}{x} dx$

j)  $\int t^2 e^t dt$

k)  $\int \cos^3 x \sin x dx$