

Math 132: Calculus for the Physical & Life Sciences 2
Problem Set 4
Due Friday, February 15, 2008, at the beginning of class.

General Directions: You must show all work for credit on these problems.

1. Use trigonometric substitutions (possibly after completing the square) to evaluate each of the following integrals.

a. $\int \frac{1}{\sqrt{9 + 4x^2}} dx$

b. $\int \frac{\sqrt{x^2 - 1}}{x^2} dx$

c. $\int \frac{1}{\sqrt{3 - 2x - x^2}} dx$

2. Integrate using the partial fraction technique (divide the denominator polynomial into the top first when necessary).

a. $\int \frac{1}{x^2 + x - 6} dx$

b. $\int \frac{x^4}{x^2 + 4} dx$

c. $\int \frac{x + 10}{2x^2 + 5x - 3} dx$

d. $\int \frac{x^2 + 1}{x^3 + 2x^2 + x} dx$

e. $\int \frac{x + 4}{x^3 + 4x} dx$

3. Integrate using the table of integrals in Stewart, and preliminary substitutions or algebraic manipulation as necessary.

a. $\int \frac{x^2}{\sqrt{x^2 + 25}} dx$

b. $\int \sqrt{2x - x^2} dx$

c. $\int \frac{dx}{\sqrt{e^{2x} - 1}}$

d. $\int \frac{\cos(x)}{\sqrt{4 - \sin^2(x)}} dx$

e. $\int \frac{\sec^2(x)}{\tan^2(x) + 2 \tan(x) + 2} dx$

f. $\int e^x \sqrt{1 + e^{2x}} dx$