Math 167, Some review problems and topics, part 1

Chapter 6:

1. Show how to find the derivatives using exponents and logs:

a. $f(x) = 2^x$ b. $f(x) = 2^{\tan x}$ c. $f(x) = x^x$ d. $f(x) = (\cos x)^x$

2. Find the derivatives

a. $\frac{d}{dx}\sin^{-1}(4x)$ b. $\frac{d}{dx}\frac{e^{3x}+\cos x}{x^2}$ c. $\frac{d}{dx}\ln(x^2+3x+1)$ d. $\frac{d}{dx}\sqrt{x}\,e^{4x}$

3. Find the integrals:

a. $\int \frac{1+3x}{\sqrt{1-x^2}}dx$ b. $\int \frac{2}{2-5x}dx$ c. $\int 2^x\,dx$

Chapter 7:

4. Find the improper integrals

a. $\int x\cos(4x)dx$ b. $\int \frac{x^2}{e^x}dx$ c. $\int \ln x\ dx$ d. $\int \tan^{-1} 3x\,dx$

e. $\int \sin^3 x\cos^2 x\,dx$ f. $\int \sec^4 x\,dx$ g. $\int \tan^3 x\ dx$ h. $\int \cos^2 3x\,dx$