

PRACTICE PROBLEM SET FOR SECTION 8.4 (SPECIAL SUBSTITUTIONS)

I) Determine the following indefinite integrals (using the method discuss in 8.3):

A) $\int \sec^3 u \, du$

B) $\int \sec^5 u \, du.$

II) Solve the following indefinite integrals using the special trigonometric substitutions discussed in 8.4.

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

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

(3) $\int \frac{dx}{x^2\sqrt{x^2-1}}$

(4) $\int \frac{dx}{x^2\sqrt{1-x^2}}$

(5) $\int \frac{dx}{x\sqrt{x^2-1}}$

(6) $\int \frac{dx}{\sqrt{1+x^2}}$

(7) $\int x^2\sqrt{1+x^2} \, dx$

(8) $\int x^2\sqrt{1-x^2} \, dx$

(9) $\int x\sqrt{1-x^2} \, dx$

(10) $\int \frac{x}{\sqrt{1+x^2}} \, dx$

(11) $\int \frac{x^2}{\sqrt{1+x^2}} \, dx$

(12) $\int \frac{x^2}{\sqrt{x^2-1}} \, dx$

(13) $\int \frac{x^2}{\sqrt{1-x^2}} \, dx$

(14) $\int \frac{x^2}{(1+x^2)^{3/2}} \, dx$