

Quiz Date: September 04, 2017

**Instructions:** The following exercises are similar to those found in the course text book. This homework is not due for a grade, but you should know how to do all of them and be able to show your work for each. You can expect at least one of these problems to appear on an in-class quiz on the date listed above.

## 6.2 - Trigonometric Integrals and Substitution

1. Evaluate the integral.

a.  $\int \sin^3 \theta \cos^4 \theta d\theta$

c.  $\int \tan x \sec^3 x dx$

b.  $\int_0^\pi \cos^4(2t) dt$

d.  $\int (\tan^2 x + \tan^4 x) dx$

2. Evaluate the integral using the given trigonometric substitution. Sketch and label the associated right triangle.

a.  $\int \frac{1}{x^2 \sqrt{4-x^2}} dx, \quad x = 2 \sin \theta$

b.  $\int \frac{x^3}{\sqrt{x^2+4}} dx, \quad x = 2 \tan \theta$

c.  $\int \frac{\sqrt{x^2-4}}{x} dx, \quad x = 2 \sec \theta$

3. Evaluate the integral.

a.  $\int_{\sqrt{2}}^2 \frac{1}{t^3 \sqrt{t^2-1}} dt$

b.  $\int_0^2 x^3 \sqrt{x^2+4} dx$

## 6.3 - Partial Fractions

4. Perform the partial fraction decomposition.

a.  $\frac{1+6x}{(4x-3)(2x+5)}$

d.  $\frac{x^6}{x^2-4}$

b.  $\frac{10}{5x^2-2x^3}$

e.  $\frac{x^4}{(x^2-x+1)(x^2+2)^2}$

c.  $\frac{x}{x^2+x-2}$

5. Evaluate the integral.  $\int_0^1 \frac{2x+3}{(x+1)^2} dx$

6. Make a substitution to express the integrand as a rational function and then evaluate the integral.  $\int \frac{e^{2x}}{e^{2x}+3e^x+2} dx$