Math 32, Homework 7 on sections 7.1, 7.2, 7.3

Write all your working out and answers on your own notepaper - no need to write the questions. Please use lots of space.

It is very important that you show clearly any work you had to do to get your answers. Just writing the answer down with no work shown is not enough. All 15 questions are worth 2 points each. Hand in your solutions next week only.

Do these first 10 questions and *check that your answers match the solutions on page 2*. If you don't get the same answers then look at your notes or the book or ask me. Only do the last five questions when you are sure you understand the first ten.

(1) Evaluate: $\int t^2 \ln(t)\, dt$

(2) Compute: $\int x \sec^2(x)\, dx$

(3) Find: $\int x \tan^2(x)\, dx$

(4) Evaluate: $\int \arcsin(x)\, dx$

(5) Calculate: $\int_0^{\pi/2} \sin^{10}(x) \cos^3(x)\, dx$

(6) Compute: $\int \cos^4(x)\, dx$

(7) Find: $\int \tan^3\theta \cdot \sec\theta\, d\theta$

(8) Use the formula $\sin(A)\sin(B) = \frac{1}{2}(\cos(A-B) - \cos(A+B))$ to find:

$$\int_0^{\pi/4} \sin(3\theta)\sin(5\theta)\, d\theta$$

(9) Use the trigonometric substitution $x = 4\tan\theta$ to evaluate:

$$\int_0^4 \frac{dx}{16+x^2}$$

(10) With a trigonometric substitution find: $\int \frac{dx}{x^2\sqrt{4-x^2}}$

Five more questions. Show clearly all your working out and reasoning.

(11) Find: $\displaystyle\int xe^{3x}\,dx$

(12) Find: $\displaystyle\int \frac{\ln x}{x^2}\,dx$

(13) Calculate: $\displaystyle\int \sin^5(x)\cos^2(x)\,dx$

(14) Evaluate: $\displaystyle\int \tan^{11}\theta\cdot\sec^6\theta\,d\theta$

(15) With a trigonometric substitution find $\displaystyle\int \frac{x^3}{\sqrt{x^2+9}}\,dx$ and make sure your answer is in terms of x.

You can also try other questions from sections 7.1, 7.2, 7.3 in the book listed on the syllabus.

Answers to questions (1)-(10):

(1) $\dfrac{t^3\ln t}{3}-\dfrac{t^3}{9}+C$

(2) $x\tan x-\ln|\sec x|+C$

(3) $-x^2/2+x\tan x-\ln|\sec x|+C$

(4) $x\arcsin x+\sqrt{1-x^2}+C$

(5) $\dfrac{2}{143}$

(6) $\dfrac{3x}{8}+\dfrac{\sin(2x)}{4}+\dfrac{\sin(4x)}{32}+C$

(7) $\dfrac{\sec^3(\theta)}{3}-\sec(\theta)+C$

(8) $1/4$

(9) $\pi/16$

(10) $-\dfrac{\sqrt{4-x^2}}{4x}+C$