Ch.8 Techniques of Integration :-

Some integral Formulas :-

1. $\int a\,dx = ax + c$

2. $\int a x^n dx = \frac{a x^{n+1}}{n+1} + c, n \neq -1$

3. $\int \frac{a}{x} dx = a \ln|x| + c$

4. $\int \frac{f'(x)}{f(x)} dx = \ln|f(x)| + c$

5. $\int e^{ax} = \frac{e^{ax}}{a} + c$

6. $\int a^x dx = \frac{a^x}{\ln a} + c$

7. $\int \sin(ax)\,dx = \frac{-1}{a}\cos(ax) + c$

8. $\int \cos(ax)\,dx = \frac{1}{a}\sin(ax) + c$

9. $\int \tan x\,dx = \ln|\sec x| + c$

10. $\int \cot x\,dx = \ln|\sin x| + c$

11. $\int \sec x\,dx = \ln|\sec x + \tan x| + c$

12. $\int \csc x\,dx = -\ln|\csc x + \cot x| + c = \ln|\csc x - \cot x| + c$

13. $\int \sec^2 x\,dx = \tan x + c$

14. $\int \csc^2 x\,dx = -\cot x + c$

15. $\int \sec x \tan x\,dx = \sec x + c$

16 $\int \csc x \cot x \, dx = -\csc x + C$

17 $\int \cosh(ax) \, dx = \frac{\sinh(ax)}{a} + C$

18 $\int \sinh(ax) \, dx = \frac{\cosh(ax)}{a} + C$

19 $\int \operatorname{sech}^2 x \, dx = \tanh x + C$

20 $\int \operatorname{csch}^2 x \, dx = -\coth x + C$

21 $\int \operatorname{sech} x \tanh x \, dx = -\operatorname{sech} x + C$

22 $\int \operatorname{csch} x \coth x \, dx = -\operatorname{csch} x + C$

23 $\int \frac{1}{\sqrt{a^2 - x^2}} dx = \sin^{-1}\left(\frac{x}{a}\right) + C$

24 $\int \frac{1}{a^2 + x^2} dx = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) + C$

25 $\int \frac{1}{x\sqrt{x^2 - a^2}} dx = \frac{1}{a} \sec^{-1}\left|\frac{x}{a}\right| + C$

Mathematics Department

Math 1411 – Worksheet # 10

Chapter 8

Rasha shadid

Name: - - - - -

Q. Evaluate the following Integral:

[1] $\int \cos\left(\sqrt[3]{x}\right) dx$

[2] $\int x^2 \cosh 2x \, dx$

[3] $\int \sin x \cos^4 x \, dx$

[4] $\int_0^{\pi/2} x\sqrt{1-\cos(2x)} \, dx$

Short Answers Worksheet #10

Q1 $I = 3x^{2/3}\sin\left(x^{1/3}\right) + 6x^{1/3}\cos\left(x^{1/3}\right) - 6\sin\left(x^{1/3}\right) + C$

2 $I = \frac{1}{2}x^2\sinh(2x) - \frac{x\cosh(2x)}{2} + \frac{1}{4}\sinh(2x) + C$

3 $I = \frac{-1}{5}\cos^5(x) + C$

4 $I = \sqrt{2}$