SI Session Week 11
Thursdays 4:00 – 5:30 PM, Rm. 1229
Fridays 2:00 – 3:30 PM. Rm. 1223

Prof. Stockton : Calculus I : Fall 2007
SI Leader : Neil Jody

Directions: Evaluate and/or calculate as indicated.

Tips: $\int cf(x)\,dx = c\int f(x)\,dx$,
$\int\left[f(x)\pm g(x)\right]dx = \int f(x)\,dx \pm \int g(x)\,dx$
$\int x^n dx = \frac{x^{n+1}}{n+1} + C$, if $n \neq -1$

1. A window has the shape of a rectangle surmounted by a semicircle. If the perimeter of the window is 15 ft, find the dimensions that will allow the maximum amount of light to enter.

2. $\int \frac{x^3 - x + 2}{\sqrt{x}} dx$

3. $\int_3^6 x^2\sqrt{x-2}\ dx$

4. $\int \frac{\sin\left(\sqrt{x}+3\right)}{\sqrt{x}}\ dx$

5. $\int \frac{3\cos\left(4+\frac{1}{x}\right)}{x^2} dx$

6. $\int_0^{\pi/3} \sin x\cos^2 x\ dx$

7. $\int_1^e \frac{(\ln x)^4}{x} dx$

8. $\int_4^9 \frac{1}{\sqrt{x}\left(2\sqrt{x}-3\right)} dx$

9. $\int \frac{3x}{4+x^2} dx$

10. $\int \frac{\sin(\ln x)}{x} dx$

11. $\int_0^{\pi/6} \frac{\cos x}{2\sin x + 1} dx$

12. $\int \frac{\tan\sqrt{x}}{\sqrt{x}} dx$

13. $\int \frac{2x^2 - x + 3}{\sqrt{x}}\ dx$

14. $\int (\cos x + \sin x)^2\ dx$

15. $\int \frac{3x+6}{\sqrt[3]{x^2+4x-3}} dx$

16. $\int \frac{x}{(4-x)^3}\ dx$

17. $\int_0^{\pi/2} \sin x\sqrt{3\cos x + 1}\ dx$

18. $\int \sec^2\left(\frac{x}{3}\right)\tan^2\left(\frac{x}{3}\right)\ dx$

19. $\int_{-2}^{3} |2x-4|\ dx$

Find $\frac{dy}{dx}$ for the following.

20. $y = \ln\left(\frac{x^2\sin x\sqrt{2x+3}}{(x^2+4)\ln x}\right)$

21. $y = \tan(\ln\sqrt{x})$

22. $y = \ln(\sin(3x))$

23. $\ln\left(xy^2\right) = \cos x$