University of Calgary
Faculty of Science
Department of Mathematics and Statistics

Math 249-L05 Fall 2005

Worksheet 11, Answers
[Integration]

1. $\tan x - \sec x + k$

2. $\tan x + \sec x + k$

3. $csc\ x - \cot x + k$

4. $-\cot x - csc\ x + k$

5. $\ln|\sec x + \tan x| + k$

6. $\ln|\sec x + \tan x| + k$

7. $\ln|\ln x| + k$

8. $-2\left(1 + \sqrt{x}\right)^{-1} + k$

9. $-\frac{2}{15}\left(1 - 3\theta^2\right)^{5/4} + k$

10. $\frac{(1-x^2)^{3/2}}{3} - \frac{2(1-x^2)^{5/2}}{5} + \frac{(1-x^2)^{7/2}}{7} + k$

11. $\frac{1}{6}\sin\left(3x^2\right) + k$

12. $\frac{1}{3}e^{3x} + k$

13. $\frac{1}{4}e^{x^4} + k$

14. $2\,e^{\sqrt{x}} + k$

15. $\frac{1}{8}\left(4 - x^4\right)^{-2} + k$

16. $\frac{4}{\sqrt{\cos\sqrt{\theta}}} + k$

17. $\frac{1}{3}\tan^3 x + k$

18. $-\frac{1}{8}\cot^8 x + k$

19. $-\ln|1 - \sin x| + k$

20. $\ln|1 + e^x| + k$

21. $\ln|e^x - e^{-x}| + k$

22. $\frac{\tan^2 x}{2} + k$ or $\frac{\sec^2 x}{2} + C$

23. $\frac{1}{2}\sin^2 x + k$ or $-\frac{\cos^2 x}{2} + C$
or $-\frac{1}{4}\cos(2x) + c$

24. $-\frac{1}{6}(3 - 4x)^{3/2} + k$

25. $\frac{2}{3}\left(y^3 + 6y^2 - 12y + 9\right)^{1/2} + k$

26. $\ln|x + x\ln x| + k$

27. $\frac{x}{2} - \frac{\sin 2x}{4} + k$

University of Calgary
Faculty of Science
Department of Mathematics and Statistics

Math 249-L05 Fall 2005

Worksheet 11, Answers
[Integration]

28. $\frac{x}{2} + \frac{\sin 2x}{4} + k$

29. $-\frac{1}{3}\cos^3 x + \frac{1}{5}\cos^5 x + k$

30. $\sin x - \frac{1}{3}\sin^3 x + k$

31. $\ln\left|x^4 + 2x^3 - 4x^2 + 5\right| + k$

32. $\frac{3}{8}\left(1 + t^{2/3}\right)^4 + k$

33. $\frac{\sec^5 x}{5} - \frac{\sec^3 x}{3} + k$

34. $\frac{1}{2}e^{\sin 2x} + k$

35. $\frac{(x+1)^{5/2}}{5} - \frac{4(x+1)^{3/2}}{3} + k$

36. $-\frac{4(2-3x)^{3/2}}{27} + \frac{2(2-3x)^{5/2}}{45} + k$

37. $\tan x + k$

38. $-\frac{1}{3}e^{\cot 3x} + k$

39. $e^{\ln x} + k$

40. $-\cot x - x + k$

41. $\tan x - x$

42. $-\ln|\cos x| + k = \ln|\sec x| + k$

43. $\frac{1}{4}\ln|\sin 4x| + k$

44. $x + k$

45. $x + k$