

1 2 3 4 5 6 7 8 9  
 10 11 12 13 14 15 16 17 18 19  
 20 21 22 23 24 25 26 27 28 29  
 30 31 32 33 34 35 36 37 38 39  
 40 41 42 43 44 45 46 47  
 48 49 50 51

## Lots of Lovely Integrals

1.  $\int x \cos x \, dx$

2.  $\int_0^2 x e^{-x} \, dx$

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

4.  $\int \frac{x^3}{\sqrt{1-x^2}} \, dx$

5.  $\int \frac{1}{\cos^2 \theta} \, d\theta$

6.  $\int \frac{1}{(2x-3)^3} \, dx$

7.  $\int \frac{1-x}{\sqrt{x}} \, dx$

8.  $\int \frac{x^2-1}{x^3-3x+1} \, dx$

9.  $\int \frac{1}{x} \sqrt{\ln x} \, dx$

10.  $\int_1^2 \frac{2x-1}{(x+1)^2} \, dx$

11.  $\int_{\frac{1}{2}}^{2\frac{1}{2}} x \sqrt{2x-1} \, dx$

12.  $\int \frac{x}{(2x-3)^2} \, dx$

13.  $\int \frac{1}{\sqrt{x}} \sin \sqrt{x} \, dx$

14.  $\int \frac{1}{x} \ln x \, dx$

15.  $\int x \sqrt{x+1} \, dx$

16.  $\int_0^\pi x \sin x \, dx$

17.  $\int_0^{\frac{1}{2}} x^2 e^{2x} \, dx$

18.  $\int_0^1 (x+e^x)^2 \, dx$

19.  $\int x^2 \cos x \, dx$

20.  $\int e^{7x} \, dx$

21.  $\int \cos 11x \, dx$

22.  $\int x e^{5x^2} \, dx$

23.  $\int \sin x \sin(\cos x) \, dx$

24.  $\int_1^4 \frac{1}{1+\sqrt{x}} \, dx$

25.  $\int_1^2 x^2 \sqrt{x-1} \, dx$

26. Use the substitution  $u = \sqrt{x}$  to evaluate

$\int \frac{1}{x+\sqrt{x}} \, dx$

27.  $\int \frac{x^2}{\sqrt{1+x}} \, dx$

28.  $\int \frac{x}{1+2x} \, dx$

29.  $\int \frac{x^2}{1+x} \, dx$

30.  $\int \frac{1}{4x+7} \, dx$

31.  $\int \frac{x-2}{x^2-4x+11} \, dx$

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

33.  $\int_0^5 \frac{x}{\sqrt{x+4}} \, dx$

34.  $\int 2x(x+2)^5 \, dx$

35.  $\int \sqrt{3x-2} \, dx$

36.  $\int 6x \sin(x^2-4) \, dx$

37.  $\int 5x \cos(5-x^2) \, dx$

38.  $\int x(x+2)^9 \, dx$

39.  $\int (x+2)^9 \, dx$

40.  $\int (3x+2)^9 \, dx$

41.  $\int \frac{3x}{\sqrt{2x+3}} \, dx$

42.  $\int_1^2 (x+2)(x-1)^5 \, dx$

43.  $\int_0^1 4x(2x-1)^4 \, dx$

44.  $\int x^3 \ln x \, dx$

45.  $\int \ln x \, dx$

46.  $\int 2x \sin(3x-1) \, dx$

47.  $\int 2x \ln(x+1) \, dx$

48.  $\int x \ln(2x+1) \, dx$

49.  $\int \frac{1}{x^3} \ln x \, dx$

50.  $\int x^2 e^{3x} \, dx$

51.  $\int e^x \sin x \, dx$

60 61 52 53 54 55 56 57 58 59  
62 63 64 65 66 67 68 69  
70 71 72 73 74 75 76 77 78 79  
80 81 82 83 84 85 86 87 88 89  
90 91 92 93 94 95 96 97 98 99 100

52.  $\int e^{2x} \cos 2x \, dx$

53.  $\int \ln(2x+1) \, dx$

54.  $\int_1^4 \frac{\ln x}{x^2} \, dx$

55.  $\int \tan x \, dx$

(Hint: what is another way of writing  $\tan x$ ?)

56.  $\int \frac{1}{x^2} \, dx$

57.  $\int \frac{2}{x} \, dx$

58.  $\int \frac{8x}{(x^2-4)^5} \, dx$

59.  $\int 4x(3x-5) \, dx$

60.  $\int 9 \cos 3x \, dx$

61.  $\int \frac{x^2}{x^3+1} \, dx$

62.  $\int \frac{\cos(2x+3)}{\sin^4(2x+3)} \, dx$

63.  $\int x \cos(x^2+3) \, dx$

64.  $\int \frac{2x}{\cos^2(x^2+3)} \, dx$

65.  $\int_0^\pi \sin \frac{3x}{2} \, dx$

66.  $\int_0^{\pi/4} \frac{1}{\cos^2 x} \, dx$

67.  $\int_4^5 \frac{2x-1}{(x-3)^{3/2}} \, dx$

68.  $\int \left(x - \frac{2}{3x}\right)^2 \, dx$

69.  $\int_0^\pi x \sin\left(\frac{1}{3}x\right) \, dx$

70.  $\int_e^{e^3} \frac{1}{x(\ln x)^2} \, dx$

71.  $\int \frac{\sqrt{\ln x}}{x} \, dx$

72.  $\int_0^1 2x e^{5x} \, dx$

73.  $\int \tan 2x \, dx$   
(see Q55 for a hint)

74.  $\int e^{2x} (e^{2x} + 1)^6 \, dx$

75.  $\int_0^1 \frac{2x-1}{(x-3)^2} \, dx$

76.  $\int \sin x e^{\cos x} \, dx$

77.  $\int \frac{x^3}{1+x} \, dx$

78.  $\int_0^{3/4} x \sqrt{1+x^2} \, dx$

79.  $\int_1^2 (1-2x)^{-2} \, dx$

80.  $\int_1^2 (1-2x)^{-3} \, dx$

81.  $\int_1^2 x(1-2x)^{-3} \, dx$

82.  $\int \frac{\ln(x+1)}{x+1} \, dx$

83.  $\int x^6 e^{x^7-1} \, dx$

84.  $\int x(3-x)^{10} \, dx$

85.  $\int_{-\pi}^0 x \sin x \, dx$  Compare your answer to that of Q16. Can you explain what you find?

86.  $\int \frac{2(\ln x)^2 + 3 \ln x - 1}{x} \, dx$

87.  $\int \frac{1}{x} \cos(\ln x) \, dx$

88.  $\int e^{5-2x} \, dx$

89.  $\int \left(x + \frac{1}{x}\right)^2 \, dx$

90.  $\int x^3 \cos(x^2) \, dx$

91.  $\int_1^2 x^5 \ln x \, dx$

92.  $\int (2x+1)(3x^2+3x-1)^{5/2} \, dx$

93.  $\int \frac{x^3}{x-2} \, dx$

94.  $\int x e^{4x^2-1} \, dx$

95.  $\int_1^3 \frac{1}{3x-1} \, dx$

96.  $\int \frac{3+x}{x^2+6x-5} \, dx$

97.  $\int (2x-1)(2x+1)^7 \, dx$

98.  $\int \sin 2x \cos^2 2x \, dx$

99.  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} \, dx$

100.  $\int \ln(2e^x) \, dx$