

Techniques of integration:

1. Evaluate the integral.

1. $\int \cos x(1 + \sin^2 x) dx$

2. $\int t \sin t + \cos t dt$

3. $\int \frac{\sin x + \sec x}{\tan x} dx$

4. $\int \frac{\sin^3 x}{\cos x} dx$

5. $\int \frac{t}{t^4+2} dt$

6. $\int_0^1 \frac{x}{(2x+1)^3} dx$

7. $\int_{-1}^1 \frac{e^{\arctan y}}{1+y^2} dy$

8. $\int_0^1 (3x+1)^{\sqrt{2}} dx$

9. $\int_1^3 r^4 \ln r dr$

10. $\int_0^4 \frac{x-1}{x^2-4x-5} dx$

11. $\int \frac{x-1}{x^2-4x+5} dx$

12. $\int \frac{x}{x^4+x^2+1} dx$

13. $\int \sin^5 t \cos^4 t dt$

14. $\int \frac{x^3}{\sqrt{1+x^2}} dx$

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

16. $\int_0^{\sqrt{2}/2} \frac{x^2}{\sqrt{1-x^2}} dx$

17. $\int_0^w t \cos^2 t dt$

18. $\int_1^4 \frac{e^{\sqrt{z}}}{\sqrt{z}} dz$

19. $\int e^{x+e^x} dx$

20. $\int e^2 dx$

21. $\int \arctan \sqrt{x} \, dx$

22. $\int \frac{\ln x}{x\sqrt{1+(\ln x)^2}} \, dx$

23. $\int_0^1 (1 + \sqrt{x})^8 \, dx$

24. $\int_0^4 \frac{6z+5}{2z+1} \, dz$

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

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

27. $\int \frac{dx}{1+e^x}$

28. $\int \sin \sqrt{at} \, dt$

29. $\int \ln(x + \sqrt{x^2 - 1}) \, dx$

30. $\int_{-1}^2 |e^x - 1| \, dx$

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

32. $\int \frac{\sqrt{2x-1}}{2x+3} \, dx$

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

34. $\int_{w/4}^{w/2} \frac{1+4 \cot x}{4-\cot x} \, dx$

35. $\int \cos 2x \cos 6x \, dx$

36. $\int_{-w/4}^{w/4} \frac{x^2 \tan x}{1+\cos^4 x} \, dx$

37. $\int_0^{w/4} \tan^3 \theta \sec^2 \theta \, d\theta$

38. $\int_{w/6}^{w/3} \frac{\sin \theta \cot \theta}{\sec \theta} \, d\theta$

39. $\int \frac{\sec \theta \tan \theta}{\sec^2 \theta - \sec \theta} \, d\theta$

40. $\int \frac{1}{\sqrt{4y^2 - 4y - 3}} \, dy$

41. $\int \theta \tan^2 \theta \, d\theta$

42. $\int \frac{\tan^{-1} x}{x^2} \, dx$

43. $\int \frac{\sqrt{x}}{1+x^3} dx$

44. $\int \sqrt{1+e^x} dx$

45. $\int x^5 e^{-x^3} dx$

46. $\int \frac{(x-1)e^x}{x^2} dx$

47. $\int x^3(x-1)^{-4} dx$

48. $\int_0^1 x\sqrt{2-\sqrt{1-x^2}} dx$

49. $\int \frac{1}{x\sqrt{4x+1}} dx$

50. $\int \frac{1}{x^2\sqrt{4x+1}} dx$

51. $\int \frac{1}{x\sqrt{4x^2+1}} dx$

52. $\int \frac{dx}{x(x^4+1)}$

2. Integration by partial fractions:

53. $\int_2^1 \frac{1}{x^2-1} dx$

54. $\int_0^1 \frac{x-1}{x^2+3x+2} dx$

55. $\int \frac{ax}{x^2-bx} dx$

56. $\int \frac{1}{(x+a)(x+b)} dx$

57. $\int_0^1 \frac{x^2-2x^2-4}{x^3-2x^2} dx$

58. $\int_0^1 \frac{x^2-4x-10}{x^2-x-6} dx$

59. $\int_1^2 \frac{4y^2-7y-12}{y(y+2)(y-3)} dy$

60. $\int \frac{x^2+2x-1}{x^2-x} dx$

61. $\int \frac{1}{(x+5)^2(x-1)} dx$

62. $\int \frac{x^2-5x+16}{(2x+1)(x-2)^2} dx$

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

64. $\int \frac{dx}{x^2(x-1)^2}$

65. $\int \frac{5x^2 - 3x - 2}{x^3 + 2x^2} dx$

66. $\int \frac{x^2 - x + 6}{x^3 + 3x} dx$

67. $\int \frac{10}{(x-1)(x^2+9)} dx$

68. $\int \frac{x^2 + x + 1}{(x^2 + 1)^2} dx$

69. $\int \frac{x^3 + x^2 + 2x + 1}{(x^2 + 1)(x^2 + 2)} dx$

70. $\int \frac{x^2 - 2x - 1}{(x-1)^2(x^2 + 1)} dx$

71. $\int \frac{x+4}{x^2 + 2x + 5} dx$

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

73. $\int \frac{1}{x^3 - 1} dx$

74. $\int_0^1 \frac{x}{x^2 + 4x + 13} dx$

75. $\int_0^1 \frac{x^2 + 2x}{x^4 + 4x^2 + 3} dx$

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

77. $\int \frac{dx}{x(x^2 + 4)^2}$

78. $\int \frac{x^4 + 3x^2 + 1}{x^5 + 5x^3 + 5x} dx$

79. $\int \frac{x^2 - 3x + 7}{(x^2 - 4x + 6)^2} dx$

80. $\int \frac{x^2 + 2x^2 + 3x - 2}{(x^2 + 2x + 2)^2} dx$

3. Integration by parts:

81. $\int x \cos 5x dx$

82. $\int x e^{-x} dx$

83. $\int r e^{\frac{r}{2}} dr$

84. $\int t \sin 2t dt$

85. $\int x^2 \sin \pi x dx$

86. $\int x^2 \cos mx dx$

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

88. $\int \sin^{-1} x dx$

89. $\int \arctan 4t dt$

90. $\int p^5 \ln p dp$



91. $\int (\ln x)^2 dx$

92. $\int t^3 e^t dt$

93. $\int e^{2\theta} \sin 3\theta d\theta$

94. $\int e^{-\theta} \cos 2\theta d\theta$

95. $\int x^2 \cos 3x dx$

96. $\int \frac{x^2}{e^{2x}} dx$

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

98. $\int \ln(x + 3) dx$

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

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