



100 INTEGRALS FOR H2 MATH

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1. $\int x^2(x^3+3)^3 dx$

2. $\int (5x^4+4x)(x^5+2x^2+1)^3 dx$

3. $\int \frac{3x-2}{(3x^2-4x-1)^3} dx$

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

5. $\int \frac{21x^2+14}{\sqrt{x^3+2x+1}} dx$

6. $\int \frac{x+5}{\sqrt{1-2x^2}} dx$

7. $\int \left(\frac{x}{\sqrt{3x^4-1}} \right)^3 dx$

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

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

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

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

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

13. $\int \frac{1}{\sqrt{x}(\sqrt{x}+1)^9} dx$

14. $\int \frac{1}{\sqrt{x}e^{\sqrt{x}}} dx$

15. $\int \frac{(\ln x)^8}{x} dx$

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

17. $\int xe^{x^2}(e^{x^2-1}) dx$

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

19. $\int x^7 \cos(x^8+2) dx$

20. $\int \frac{\tan^5 x}{\cos^2 x} dx$

21. $\int \frac{1}{\sin^2 x \tan x} dx$

22. $\int \frac{\sin x \cos x}{\sin^2 x + 7 \cos^2 x} dx$

23. $\int \frac{\sin 2x}{\sqrt{5 \sin^2 x + 4 \cos^2 x}} dx$

24. $\int e^{-x} \sin x dx$

25. $\int (\sin x)e^{\cos x} dx$

26. $\int 2^x dx$

27. $\int \frac{1}{4-9x} dx$

28. $\int \frac{1}{4-9x^2} dx$

29. $\int \frac{x}{4-9x^2} dx$

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

31. $\int \frac{x^2}{4-9x^2} dx$

32. $\int \frac{x}{\sqrt{4-9x^2}} dx$

33. $\int \frac{1}{\sqrt{1-9x}} dx$

34. $\int \frac{1}{\sqrt{1-9x^2}} dx$

35. $\int \frac{x}{\sqrt{1-9x}} dx$

36. $\int \frac{x+2}{\sqrt{(1-8x-4x^2)}} dx$

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37. $\int \frac{x}{x^2 + 4x + 7} dx$

38. $\int \frac{\sqrt{x}}{1+x} dx$ using the substitution $u = \sqrt{x}$

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

40. $\int e^{2x} \sqrt{e^{2x} + 1} dx$

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

42. $\int \frac{\sqrt{1-3x}}{\sqrt{1+3x}} dx$

43. $\int \tan^2 x \sec^4 x dx$

44. $\int \frac{e^{10x} - 1}{e^{10x} + 1} dx$

45. $\int \frac{e^{\sin^2 2x} \sin 4x}{\sqrt{1 + e^{\sin^2 2x}}} dx$

46. $\int x \tan^{-1}(3x) dx$

47. $\int x \cos(3x^2) e^{x^2} dx$

48. $\int \frac{\sin x}{1 + \cos x} dx$

49. $\int \sin^{-1} 3x dx$

50. $\int x \sin(3x^2 + 1) dx$

51. $\int x \sin^{-1}\left(\frac{2}{x}\right) dx$

52. $\int \frac{1}{x^4 - 1} dx$

53. $\int \frac{1}{\sqrt{x}(1+x)} dx$

54. $\int \frac{x^3}{\sqrt{1-x^2}} dx$ using the substitution $x = \cos u$

55. $\int e^{3x} \cos 2x dx$

56. $\int \frac{1}{(1+x^2)^2} dx$ using the substitution $x = \tan u$

57. $\int \frac{e^{\tan^{-1} x}}{1+x^2} dx$

58. $\int \frac{1}{\sqrt{x}(e^{\sqrt{x}})} dx$

59. $\int \frac{1}{x(1-\ln x)^5} dx$

60. $\int \frac{1}{\sqrt{x}(1-\sqrt{x})} dx$

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

62. $\int \frac{1}{\cos^2 x \sqrt{1+\tan x}} dx$

63. $\int \tan^7 2x + \tan^5 2x dx$

64. $\int \cos^4 x dx$

65. $\int \sin^4 x dx$

66. $\int \sec^3 x dx$

67. $\int \sec^4 x dx$

68. $\int \tan^4(3x) dx$

69. $\int \sin^3(2x-1) dx$

70. $\int \cos^3(1-x) dx$

71. $\int \cos^3(4x) \sin^8(4x) dx$

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

73. $\int \frac{4x-1}{x^2+2x+3} dx$

74. $\int \frac{5-3x}{x^2+8x+6} dx$

75. $\int \cos^5 x \sin^4 x dx$

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

77. $\int \frac{1-e^{-6x}}{1+e^{-6x}} dx$

78. $\int \ln(3x)^2 dx$

79. $\int (\ln 3x)^2 dx$

80. $\int \ln(3-x^2) dx$

81. $\int \frac{\sin x}{\sin 2x} dx$

82. $\int \frac{\sec x}{\sin x + \cos x} dx$

Worksheet: H2 Math 100 Integrals

83. $\int \ln(x^2 + 2x + 2) dx$

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

85. $\int \frac{1}{x\sqrt{x^4 - 4}} dx$ using the substitution $x^2 = 2\sec u$

86. $\int \frac{x^3}{\sqrt{1 - x^2}} dx$ using the substitution $x = \sin u$

87. $\int \frac{\sin^2 x + 1}{\cos^2 x} dx$

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

89. (a) $\int \frac{x^3 - 3}{x^2 - 3} dx$ [Carelessly solved in video]

(b) $\int \frac{x^3}{x^2 - 3} dx$ [Originally Intended]

90. $\int \frac{x^4}{x^2 - 3} dx$

91. $\int \frac{6e^{10x} - 6}{e^{10x} + 1} dx$

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

93. $\int \sqrt{\cos x + 1} dx$

94. $\int \sqrt{\sin x + 1} dx$

95. $\int \frac{\sec^2 x}{1 - \tan^2 x} dx$

96. $\int \frac{\sin x}{\cos x + \sin x} dx$

97. $\int \sin(\ln x) dx$

98. $\int \frac{e^{\tan x}}{1 - \sin^2 x} dx$

99. $\int \frac{\cot x}{1 - \cos 2x} dx$

100. $\int \frac{e^{-2x}}{e^{-x} + 1} dx$ using the substitution $u = e^{-x}$

Factor Formulae Integrals in old H2 math syllabus

1. $\int \sin 2x \cos x dx$

2. $\int \sin 7x \sin 2x dx$

3. $\int \sin 5x \cos 10x dx$

4. $\int \cos x \cos 11x dx$

5. $\int \cos \frac{2}{3}x \cos \frac{5}{2}x dx$

6. $\int \cos \frac{3}{2}x \sin \frac{5}{3}x dx$

The questions provided are not part of the new syllabus, but they're still helpful. Click for



VIDEO SOLUTIONS

To access lesson recordings, click or scan the QR code and sign up for FREE online learning portal account:

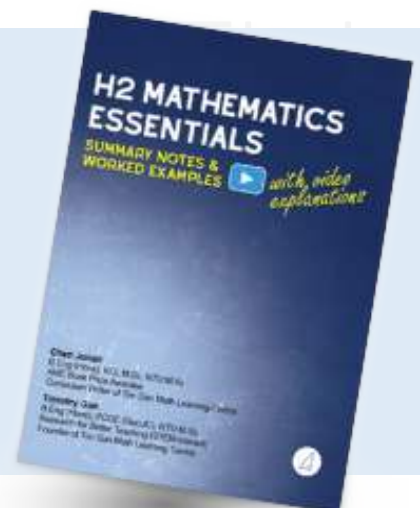


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1. $\frac{(x^3+3)^4}{12} + C$
2. $\frac{(x^5+2x^2+1)^4}{4} + C$
3. $-\frac{1}{4(3x^2-4x-1)^2} + C$
4. $\frac{2}{3}\sqrt{x^3+1} + C$
5. $14\sqrt{x^3+2x+1} + C$
6. $-\frac{1}{2}\sqrt{1-2x^2} + \frac{5}{\sqrt{2}}\sin^{-1}(\sqrt{2}x) + C$
7. $-\frac{1}{6\sqrt{3x^4-1}} + C$
8. $\frac{1}{4}\ln|x^4+3| + C$
9. $\frac{\ln|2x^2+2x+5|}{2} + C$
10. $-\sqrt{1-4x-x^2} - 2\sin^{-1}\left(\frac{x+2}{\sqrt{5}}\right) + C$
11. $\ln\sqrt{x^2+x+1} + \frac{7}{\sqrt{3}}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right) + C$
12. $\ln|x^2+x+1| + C$
13. $-\frac{1}{4(\sqrt{x}+1)^8} + C$
14. $-2e^{-\sqrt{x}} + C$
15. $\frac{(\ln x)^9}{9} + C$
16. $\frac{1}{3}\ln|\ln|x|| + C$
17. $\frac{1}{4}(e^{2x^2-1}) + C$
18. $\ln|e^x+1| + C$
19. $\frac{1}{8}\sin(x^8+2) + C$
20. $\frac{\tan^6 x}{6} + C$
21. $-\frac{\cot^2 x}{2} + C$
22. $-\frac{1}{12}\ln|\sin^2 x + 7\cos^2 x| + C$
23. $2\sqrt{5\sin^2 x + 4\cos^2 x} + C$
24. $\frac{1}{2}e^{-x}(\sin x + \cos x) + C$
25. $-e^{\cos x} + C$
26. $\frac{2^x}{\ln 2} + C$
27. $-\frac{1}{9}\ln|4-9x| + C$
28. $\frac{1}{12}\ln\left(\frac{2+3x}{2-3x}\right) + C$
29. $-\frac{1}{18}\ln|4-9x^2| + C$
30. $-\frac{1}{18}\ln|4-9x^2| + \frac{1}{4}\ln\left(\frac{2+3x}{2-3x}\right) + C$
31. $-\frac{1}{9}x + \frac{1}{27}\ln\left(\frac{2+3x}{2-3x}\right) + C$
32. $-\frac{1}{9}\sqrt{4-9x^2} + C$
33. $-\frac{2}{9}\sqrt{1-9x} + C$
34. $\frac{1}{3}\sin^{-1}(3x) + C$
35. $-\frac{1}{9}\left(\frac{2}{9}\sqrt{1-9x} - \frac{2}{27}\sqrt{(1-9x)^3}\right) + C$
36. $-\frac{1}{4}\sqrt{1-8x-4x^2} + \frac{1}{2}\sin^{-1}\frac{2\sqrt{5}(x+1)}{5} + C$
37. $\frac{1}{2}\ln(x^2+4x+7) - \frac{2}{\sqrt{3}}\tan^{-1}\left(\frac{x+2}{\sqrt{3}}\right) + C$
38. $2(\sqrt{x} - \tan^{-1}\sqrt{x}) + C$
39. $x^2\sqrt{x^2+4} - \frac{2}{3}(x^2+4)^{\frac{3}{2}} + C$
40. $\frac{1}{3}(e^{2x}+1)^{\frac{3}{2}} + C$
41. $\frac{1}{2}\ln(x^2-2x+4) - \frac{2}{\sqrt{3}}\tan^{-1}\frac{x-1}{\sqrt{3}} + C$
42. $\frac{1}{3}\sin^{-1}3x + \frac{1}{3}\sqrt{1-9x^2} + C$
43. $\frac{\tan^3 x}{3} + \frac{\tan^5 x}{5} + C$
44. $-\frac{1}{5}\ln|e^{-5x} + e^{5x}| + C$
45. $\sqrt{1+e^{\sin^2 2x}} + C$
46. $\frac{x^2}{2}\tan^{-1}3x - \frac{1}{6}\left[x - \frac{1}{3}\tan^{-1}3x\right] + C$
47. $\frac{1}{20}\cos(3x^2)e^{x^2} + \frac{3}{20}\sin(3x^2)e^{x^2} + C$
48. $-\ln|1+\cos x| + C$
49. $x\sin^{-1}3x + \frac{1}{3}\sqrt{1-9x^2} + C$
50. $-\frac{1}{6}\cos(3x^2+1) + C$

Worksheet: H2 Math 100 Integrals

51. $\frac{x^2}{2} \sin^{-1}\left(\frac{2}{x}\right) + \sqrt{x^2 - 4} + C$
52. $-\frac{1}{4}(\ln|x+1| + 2 \tan^{-1} x - \ln(|x-1|)) + C$
53. $2 \tan^{-1} \sqrt{x} + C$
54. $\frac{1}{3}(1-x^2)^{\frac{3}{2}} - (1-x^2)^{\frac{1}{2}} + C$
55. $\frac{1}{13} e^{3x} (3 \cos 2x + 2 \sin 2x) + C$
56. $\frac{1}{2} \left(\tan^{-1} x + \frac{x}{1+x^2} \right) + C$
57. $e^{\tan^{-1} x} + C$
58. $-2e^{-\sqrt{x}} + C$
59. $\frac{1}{4(1-\ln x)^4} + C$
60. $-2 \ln|1-\sqrt{x}| + C$
61. $-4\sqrt{1-\sqrt{x}} + C$
62. $2\sqrt{1+\tan x} + C$
63. $\frac{\tan^6 2x}{12} + C$
64. $\frac{3}{8}x + \frac{1}{4} \sin 2x + \frac{1}{32} \sin 4x + C$
65. $\frac{3}{8}x - \frac{1}{4} \sin 2x - \frac{1}{32} \sin 4x + C$ weq
66. $\frac{1}{2}(\sec x \tan x + \ln|\sec x + \tan x|) + C$
67. $\tan x + \frac{\tan^3 x}{3} + C$
68. $\frac{1}{9} \tan^3(3x) + x - \frac{1}{3} \tan(3x) + C$
69. $-\frac{1}{2} \cos(2x-1) + \frac{1}{6} \cos^3(2x-1) + C$
70. $-\sin(1-x) + \frac{\sin^3(1-x)}{3} + C$
71. $\frac{1}{4} \left[\frac{\sin^9(4x)}{9} - \frac{\sin^{11}(4x)}{11} \right] + C$
72. $-\sqrt{2-x-x^2} + \frac{1}{2} \sin^{-1}\left(\frac{2x+1}{3}\right) + C$
73. $2 \ln(x^2 + 2x + 3) - \frac{5}{\sqrt{2}} \tan^{-1}\left(\frac{x+1}{\sqrt{2}}\right) + C$
74. $-\frac{3}{2} \ln|x^2 + 8x + 6| + \frac{17\sqrt{10}}{20} \ln \left| \frac{x+4-\sqrt{10}}{x+4+\sqrt{10}} \right| + C$
75. $\frac{1}{5} \sin^5 x - \frac{2}{7} \sin^7 x + \frac{1}{9} \sin^9 x + C$
76. $\frac{1}{2} \sin^{-1} 2x + \frac{1}{2} \sqrt{1-4x^2} + C$
77. $\frac{1}{3} \ln|e^{3x} + e^{-3x}| + C$
78. $2x \ln(3x) - 2x + C$
79. $x(\ln 3x)^2 - 2x \ln 3x + 2x + C$
80. $x \ln|3-x^2| - 2x + \sqrt{3} \ln \left| \frac{\sqrt{3}+x}{\sqrt{3}-x} \right| + C$
81. $\frac{1}{2} \ln|\tan x + \sec x| + C$
82. $\ln|\tan x + 1| + C$
83. $(x+1) \ln|x^2 + 2x + 2| - 2x + 2 \tan^{-1}(x+1) + C$
84. $\ln|x+1| - \frac{2}{3x^3} + C$
85. $\frac{1}{4} \cos^{-1} \frac{2}{x^2} + C$
86. $-\frac{1}{3} \sqrt{1-x^2} (2+x^2) + C$
87. $2 \tan x - x + c$
88. $\frac{\sqrt{3}}{2} \ln \left| \frac{x-\sqrt{3}}{x+\sqrt{3}} \right| + x + C$
89. (a) $\frac{1}{2} x^2 + \frac{3}{2} \ln|x^2-3| - \frac{3}{2\sqrt{3}} \ln \left| \frac{x-\sqrt{3}}{x+\sqrt{3}} \right| + C$
(b) $\frac{3}{2} \ln|x^2-3| + \frac{1}{2} x^2 + C$
90. $\frac{1}{3} x^3 + 3x + \frac{9}{2\sqrt{3}} \ln \left(\frac{x-\sqrt{3}}{x+\sqrt{3}} \right) + C$
91. $\frac{6}{5} \ln(e^{5x} + e^{-5x}) + C$
92. $\ln|x+1| - \frac{1}{2} \ln(x^2+x+1) + \frac{1}{\sqrt{3}} \tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right) + C$
93. $2\sqrt{2} \sin\left(\frac{x}{2}\right) + C$
94. $2 \sin\left(\frac{x}{2}\right) - 2 \cos\left(\frac{x}{2}\right) + C$
95. $\frac{1}{2} \ln \left(\frac{1+\tan x}{1-\tan x} \right) + C$
96. $\frac{1}{2} x - \frac{1}{2} \ln|\sin x + \cos x| + C$
97. $\frac{x}{2} [\sin(\ln x) - \cos(\ln x)] + C$
98. $e^{\tan x} + C$
99. $-\frac{1}{4} \operatorname{cosec}^2 x + C$
100. $\ln(e^{-x} + 1) - e^{-x} + C$