

Integration worksheet

Calculate the following antiderivatives using any of the following techniques:

- i. Elementary methods (can the function be recognized as the derivative of a function we know?)
- ii. u -Substitution.
- iii. Integration by parts.
- iv. Trigonometric substitution.

This includes simplifying, expanding, or otherwise rewriting expressions in order to use the above techniques. For example, the use of trigonometric manipulation (using trig identities to rewrite expressions so that u -substitution or other methods can be used), common “multiply the top and bottom by...” techniques, partial fractions manipulation to rewrite rational functions, etc..

1. $\int \sin^2(7x) dx$

9. $\int \tan^2(7x) dx$

2. $\int \sin^3(7x) dx$

10. $\int \sec(7x) dx$

3. $\int \sin^4(7x) dx$

11. $\int \sec^2(7x) dx$

4. $\int \cos(7x) \sin(7x) dx$

12. $\int \tan(7x) \sec(7x) dx$

5. $\int \cos(7x) \sin^2(7x) dx$

13. $\int \tan^2(7x) \sec(7x) dx$

6. $\int \cos^2(7x) \sin^2(7x) dx$

14. $\int \tan(7x) \sec^2(7x) dx$

7. $\int \cos^3(7x) \sin^2(7x) dx$

15. $\int \tan^2(7x) \sec^2(7x) dx$

8. $\int \tan(7x) dx$

16. $\int \tan^3(7x) \sec^3(7x) dx$

17. $\int \frac{x+2}{x^2-x-6} dx$
18. $\int \csc(x) \cos(x) dx$
19. $\int xe^{x^2} dx$
20. $\int \frac{x^4}{(x^2+1)^{3/2}} dx$
21. $\int \frac{\sin(x)}{1-\cos^2(x)} dx$
22. $\int \frac{1}{x\sqrt{5-x^2}} dx$
23. $\int x^3\sqrt{x^2-1} dx$
24. $\int \frac{1}{(x^2+1)^2} dx$
25. $\int \csc^3(x) dx$
26. $\int \frac{\sin(x)}{1+\cos^2(x)} dx$
27. $\int x \cos^{-1}(2x) dx$
28. $\int \csc(x) \sin(x) dx$
29. $\int x^2 2^x dx$
30. $\int \frac{\sqrt{25x^2-1}}{x} dx$
31. $\int \frac{1}{x^4\sqrt{4-16x^2}} dx$
32. $\int \sqrt{x}(1+\sqrt{x}) dx$
33. $\int \frac{\csc^2(x)}{1+\cot(x)} dx$
34. $\int \frac{x-3}{x^2+4} dx$
35. $\int x\sqrt{1+x} dx$
36. $\int \frac{x^3+x}{(x^2+1)^2} dx$
37. $\int \frac{(x+1)^3}{x-2} dx$
38. $\int \frac{1}{x\sqrt{1-x^2}} dx$
39. $\int \frac{2x-1}{x^2-x-6} dx$
40. $\int x \cos(2x) dx$
41. $\int \frac{\ln(x)}{\sqrt{x}} dx$
42. $\int \tan^{-1}(5x) dx$
43. $\int \csc^2(x) dx$
44. $\int \sqrt{6-x^2} dx$
45. $\int x\sqrt{1-16x^4} dx$
46. $\int \frac{x}{(x^2+1)^2} dx$

$$47. \int \csc(x) \, dx$$

$$48. \int \frac{\csc^2(x)}{1 + \cot^2(x)} \, dx$$

$$49. \int \frac{x + 2}{x^2 + 4x + 13} \, dx$$

$$50. \int \frac{3x + 1}{x^2 - x - 6} \, dx$$

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

$$52. \int \frac{\sin(2x)}{\cos(x)} \, dx$$

$$53. \int xe^{2x} \, dx$$

$$54. \int (\ln(x))^2 \, dx$$

$$55. \int \csc(x) \cot(x) \, dx$$

$$56. \int x \sin^{-1}(3x) \, dx$$

$$57. \int \frac{x^5}{\sqrt{4x^2 + 1}} \, dx$$

$$58. \int x \ln(2x) \, dx$$

$$59. \int e^{3x} \cos(2x) \, dx$$

$$60. \int \frac{1}{(x^2 + 4)^2} \, dx$$