

INTEGRATION USING SUBSTITUTION METHOD

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1 Examples

1. Find $\int x\sqrt{x^2 - 1} \, dx$.
2. Find $\int \frac{5x^3 + 2}{x^2} \, dx$. *(Note: This is likely solvable by simplification, not primarily substitution as presented in the solution slide)*

2 ClassWork Problems

Evaluate the following indefinite integrals:

3. $\int (x - 1)^4 \, dx$
4. $\int (x - 3)^{5/2} \, dx$
5. $\int 2x(x^2 - 1)^7 \, dx$
6. $\int x(1 - 2x^2)^3 \, dx$
7. $\int \frac{x^2}{(1 + x^3)^2} \, dx$
8. $\int \frac{x^2}{(x^3 - 1)^2} \, dx$
9. $\int \frac{x + 1}{(x^2 + 2x - 3)^2} \, dx$
10. $\int \frac{6x}{(1 + x^2)^3} \, dx$
11. $\int \frac{x - 2}{\sqrt{x^2 - 4x + 3}} \, dx$
12. $\int \frac{4x + 6}{(x^2 + 3x + 7)^3} \, dx$

13. $\int 5u \sqrt[3]{1-u^2} \, du$

14. $\int u^3 \sqrt{u^4+2} \, du$

15. $\int \frac{4y}{\sqrt{1+y^2}} \, dy$

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

17. $\int \frac{-3}{\sqrt{2t+3}} \, dt$

18. $\int \frac{t+2t^2}{\sqrt{t}} \, dt$

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

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

21. $\int (x^3+3x+9)(x^2+1) \, dx$

22. $\int (7-3x^2)(2x+1) \, dx$