

## EXERCISES 1

Calculate each of the following indefinite integrals.

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|---------------------------------------|--------------------------------------|
| 1. $\int 2x(x^2 + 4)^5 dx$            | 2. $\int 3x^2(x^3 + 1)^2 dx$         |
| 3. $\int (x^2 - 5x)^3(2x - 5) dx$     | 4. $\int 2x\sqrt{x^2 + 3} dx$        |
| 5. $\int \frac{3x^2}{x^3 - 1} dx$     | 6. $\int 2xe^{-x^2} dx$              |
| 7. $\int \frac{\ln(2x)}{x} dx$        | 8. $\int \frac{1}{x} (\ln x)^3 dx$   |
| 9. $\int \cos^3 x \sin x dx$          | 10. $\int 2x \cos x^2 dx$            |
| 11. $\int \sin x \cos x dx$           | 12. $\int (\cos x)e^{\sin x} dx$     |
| 13. $\int \frac{1}{\sqrt{2x + 1}} dx$ | 14. $\int (x^3 - 4x)^7(3x^2 - 4) dx$ |
| 15. $\int x^2\sqrt{x^3 - 1} dx$       | 16. $\int 2 \cos(2x + 1) dx$         |

Calculate each of the following integrals by making the indicated substitutions.

17.  $\int (x + 5)^{-1/2} e^{\sqrt{x+5}} dx; u = \sqrt{x + 5}.$
18.  $\int [1 + \ln x] \sin[x \ln x] dx; u = x \ln x.$
19.  $\int \sqrt{\sin 2x} \cos 2x dx; u = \sin 2x.$
20.  $\int (\cos^2 x + 3 \cos x + 1) \sin x dx; u = \cos x.$
21.  $\int \frac{1}{x(\ln x)^3} dx; u = \ln x.$
22.  $\int \frac{e^{1/x}}{x^2} dx; u = \frac{1}{x}.$

Determine each of the following integrals by making an appropriate substitution.

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|---|---|
| 23. $\int \frac{x}{\sqrt{x^2 + 1}} dx$        | 24. $\int e^{\sin(x^2)} \cdot x \cos(x^2) dx$ |
| 25. $\int \frac{x}{e^{x^2}} dx$               | 26. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$   |
| 27. $\int \frac{x^2 - 2x}{x^3 - 3x^2 + 1} dx$ | 28. $\int \frac{1}{x \ln x} dx$               |
| 29. $\int \frac{\sin x}{(2 + \cos x)^3} dx$   | 30. $\int \cot x dx$                          |