

Questions: Introduction to integration

Donald Campbell

Summary

A selection of questions for the study guide on introduction to integration.

Before attempting these questions, it is highly recommended that you read [Guide: Introduction to integration](#).

Q1

Using the power rule and laws of indices (as appropriate), find the following indefinite integrals.

1.1. $\int x^4 dx$

1.2. $\int 2x dx$

1.3. $\int 7x^5 dx$

1.4. $\int -5 dt$

1.5. $\int \frac{3}{y^3} dy$

1.6. $\int 6x^{-4} dx$

1.7. $\int -\frac{2}{x^5} dx$

1.8. $\int \frac{8}{3x^6} dx$

1.9. $\int -\frac{7}{2z^7} dz$

1.10. $\int x^{1/3} dx$

1.11. $\int 3t^{-2/3} dt$

1.12. $\int \frac{4x^{1/4}}{3} dx$

$$1.13. \int \frac{2}{5x^{1/3}} dx$$

$$1.14. \int \frac{5}{6y^{-4/3}} dy$$

Q2

Find the following integrals.

$$2.1. \int e^{2x} dx$$

$$2.2. \int -3e^{-3x} dx$$

$$2.3. \int 2e^{11x} dx$$

$$2.4. \int \frac{4}{x} dx$$

$$2.5. \int -\frac{5}{3x} dx$$

$$2.6. \int \cos(x) dx$$

$$2.7. \int \sin(2x) dx$$

$$2.8. \int \frac{5}{6} \cos(x) dx$$

$$2.9. \int \cos(3x) dx$$

$$2.10. \int \sin\left(\frac{x}{3}\right) dx$$

Q3

Evaluate the following definite integrals with respect to x .

$$3.1. \int_1^4 2 dx$$

$$3.2. \int_{-2}^2 3x dx$$

$$3.3. \int_2^4 2x^3 dx$$

$$3.4. \int_1^{27} \frac{4}{\sqrt[3]{x}} dx$$

$$3.5. \int_0^{\ln(3)} 4e^x dx$$

$$3.6. \int_0^5 e^{-3x} dx$$

$$3.7. \int_1^2 -4e^{4x} dx$$

$$3.8. \int_1^2 \frac{2}{x} dx$$

$$3.9. \int_1^{e^3} -\frac{4}{x} dx$$

$$3.10. \int_{e^3}^{e^9} \frac{9}{5x} dx$$

$$3.11. \int_0^{\pi/2} \sin(x) dx$$

$$3.12. \int_0^{\pi} \cos(x) dx$$

$$3.13. \int_0^{\pi/4} \sin(2x) dx$$

$$3.14. \int_0^{\pi/6} \cos(2x) dx$$

$$3.15. \int_{-\pi/4}^0 \sin(3x) dx$$

[After attempting the questions above, please click this link to find the answers.](#)

Version history and licensing

v1.0: initial version created 05/25 by Donald Campbell as part of a University of St Andrews VIP project.

[This work is licensed under CC BY-NC-SA 4.0.](#)