Questions: Introduction to integration

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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.*](../studyguides/introtointegration.qmd)

## Q1

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

1.1. $ ∫x^{4} dx$

1.2. $ ∫2x dx$

1.3. $ ∫7x^{5} dx$

1.4. $ ∫−5 dt$

1.5. $ ∫\frac{3}{y^{3}} dy$

1.6. $ ∫6x^{−4} dx$

1.7. $ ∫−\frac{2}{x^{5}} dx$

1.8. $ ∫\frac{8}{3x^{6}} dx$

1.9. $ ∫−\frac{7}{2z^{7}} dz$

1.10. $ ∫x^{1/3} dx$

1.11. $ ∫3t^{−2/3} dt$

1.12. $ ∫\frac{4x^{1/4}}{3} dx$

1.13. $ ∫\frac{2}{5x^{1/3}} dx$

1.14. $ ∫\frac{5}{6y^{−4/3}} dy$

## Q2

Find the following integrals.

2.1. $ ∫e^{2x} dx$

2.2. $ ∫−3e^{−3x} dx$

2.3. $ ∫2e^{11x} dx$

2.4. $ ∫\frac{4}{x} dx$

2.5. $ ∫−\frac{5}{3x} dx$

2.6. $ ∫cos\left(x\right) dx$

2.7. $ ∫sin\left(2x\right) dx$

2.8. $ ∫\frac{5}{6}cos\left(x\right) dx$

2.9. $ ∫cos\left(3x\right) dx$

2.10. $ ∫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\left(3\right)}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}^{π/2}sin\left(x\right) dx$

3.12. $ \int\_{0}^{π}cos\left(x\right) dx$

3.13. $ \int\_{0}^{π/4}sin\left(2x\right) dx$

3.14. $ \int\_{0}^{π/6}cos\left(2x\right) dx$

3.15. $ \int\_{−π/4}^{0}sin\left(3x\right) dx$

[After attempting the questions above, please click this link to find the answers.](../answers/as-introtointegration.qmd)

## Version history and licensing

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

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