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.

Q1

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

1.1. $\int x^4 \, \mathrm{d}x$

1.2. $\int 2x \, \mathrm{d}x$

1.3. $\int 7x^5 \, \mathrm{d}x$

1.4. $\int -5 \, \mathrm{d}t$

1.5. $\int \frac{3}{y^3} \, \mathrm{d}y$

1.6. $\int 6x^{-4} \, \mathrm{d}x$

1.7. $\int -\frac{2}{x^5} \, \mathrm{d}x$

1.8. $\int \frac{8}{3x^6} \, \mathrm{d}x$

1.9. $\int -\frac{7}{2z^7} \, \mathrm{d}z$

1.10. $\int x^{1/3} \, \mathrm{d}x$

1.11. $\int 3t^{-2/3} \, \mathrm{d}t$

1.12. $\int \frac{4x^{1/4}}{3} \, \mathrm{d}x$

1.13. $\displaystyle\int \frac{2}{5x^{1/3}}\,\mathrm{d}x$

1.14. $\displaystyle\int \frac{5}{6y^{-4/3}}\,\mathrm{d}y$

Q2

Find the following integrals.

2.1. $\displaystyle\int e^{2x}\,\mathrm{d}x$

2.2. $\displaystyle\int -3e^{-3x}\,\mathrm{d}x$

2.3. $\displaystyle\int 2e^{11x}\,\mathrm{d}x$

2.4. $\displaystyle\int \frac{4}{x}\,\mathrm{d}x$

2.5. $\displaystyle\int -\frac{5}{3x}\,\mathrm{d}x$

2.6. $\displaystyle\int \cos(x)\,\mathrm{d}x$

2.7. $\displaystyle\int \sin(2x)\,\mathrm{d}x$

2.8. $\displaystyle\int \frac{5}{6}\cos(x)\,\mathrm{d}x$

2.9. $\displaystyle\int \cos(3x)\,\mathrm{d}x$

2.10. $\displaystyle\int \sin\left(\frac{x}{3}\right)\,\mathrm{d}x$

Q3

Evaluate the following definite integrals with respect to x.

3.1. $\displaystyle\int_1^4 2\,\mathrm{d}x$

3.2. $\displaystyle\int_{-2}^2 3x\,\mathrm{d}x$

3.3. $\displaystyle\int_2^4 2x^3\,\mathrm{d}x$

3.4. $\displaystyle\int_1^{27} \frac{4}{\sqrt[3]{x}}\,\mathrm{d}x$

3.5. $\displaystyle\int_0^{\ln(3)} 4e^x \, \mathrm{d}x$

3.6. $\displaystyle\int_0^5 e^{-3x} \, \mathrm{d}x$

3.7. $\displaystyle\int_1^2 -4e^{4x} \, \mathrm{d}x$

3.8. $\displaystyle\int_1^2 \frac{2}{x} \, \mathrm{d}x$

3.9. $\displaystyle\int_1^{e^3} -\frac{4}{x} \, \mathrm{d}x$

3.10. $\displaystyle\int_{e^3}^{e^9} \frac{9}{5x} \, \mathrm{d}x$

3.11. $\displaystyle\int_0^{\pi/2} \sin(x) \, \mathrm{d}x$

3.12. $\displaystyle\int_0^{\pi} \cos(x) \, \mathrm{d}x$

3.13. $\displaystyle\int_0^{\pi/4} \sin(2x) \, \mathrm{d}x$

3.14. $\displaystyle\int_0^{\pi/6} \cos(2x) \, \mathrm{d}x$

3.15. $\displaystyle\int_{-\pi/4}^{0} \sin(3x) \, \mathrm{d}x$

After attempting the questions above, please click this link to find the answers.

Version history and licensing

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