AQA, Edexcel

A Level

A Level Mathematics

C1 Integration (Answers)

Name:

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Total Marks: /38

C1 - Integration (Answers)
AQA, Edexcel

1. Integrate the following functions. *Remember to include a constant of integration*:

   (a) $y = x + c$. [2]

   (b) $y = \frac{3}{2}x^{\frac{4}{3}} + c$. [2]

   (c) $y = \frac{3}{16}x^4 + c$. [2]

   (d) $y = \frac{1}{5}x^5 + \frac{3}{2}x^2 + 8x + c$. [3]

   (e) $y = \frac{1}{3}x^3 - \frac{1}{2}x^2 + c$. [3]

   (f) $y = -\frac{5}{6}x^3 + 5x + c$. [3]

   (g) $y = \frac{1}{2}x^4 - \frac{16}{3}x^3 + 15x^2 + c$. [3]

2. $f(x) = \frac{1}{2}x^2 + 3x + 1$. [4]

3. $f(x) = 4x^4 + 3x^3 + \frac{1}{2}x - 10$. [5]

4. Consider the second derivative $f''(x) = 6x + 4$ of some cubic function $f(x)$.

   (a) $f'(x) = 3x^2 + 4x + c$. [2]

   (b) $f(x) = x^3 + 2x^2 + 10$. [4]

   (c) We solve $f'(x) = 0 = 3x^2 + 4x$. The solutions to the quadratic are $x = 0$ and $x = -\frac{4}{3}$. The point $(0, 10)$ is a minimum and the point $(-\frac{4}{3}, \frac{302}{27})$ is a maximum. [5]

5. Consider the quadratic function $f(x) = 3x^2 + 2x + 4$.

   (a) $\int_{-1}^{2} f(x)\, dx = 24$. [4]

   (b) The area under the curve $f(x)$ between $x = -1$ and $x = 2$. [2]