

C4 Review 3

1. Find the gradient of the curve $x^3 + xy - y^3 = -11$ at the point $(-1, 2)$

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.....[4]

2. Find (a) $\int x \ln x dx$

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.....[3]

Find (b) $\int \sin^2 x dx$

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.....[2]

3. By means of a substitution $u = \sin x$, find

$$\int \cos x \cos 2x dx$$

.....

 [5]

4. (i) Express $\frac{3x+7}{(x+2)(x+3)^2}$ in the form $\frac{A}{x+2} + \frac{B}{x+3} + \frac{C}{(x+3)^2}$ where A, B and C are constants.

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 [5]

Answers

1. $\frac{5}{13}$

2. (a) $\frac{1}{4}x^2(2\ln x - 1) + c$ (b) $\frac{1}{2}x - \frac{1}{4}\sin 2x + c$

3. $\sin x - \frac{2}{3}\sin^3 x + c$

4. (i) $3x + 7 = A(x + 3)^2 + B(x + 2)(x + 3) + C(x + 2)$

$\Rightarrow \mathbf{A = 1, B = -1, C = 2}$

(ii) $r = \frac{35}{216}$