



### Integration By Parts

#### Q1, (Jun 2005, Q2)

Evaluate  $\int_0^{\frac{1}{2}\pi} x \cos x \, dx$ , giving your answer in an exact form. [5]

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#### Q2, (Jan 2006, Q4)

(i) Use integration by parts to find  $\int x \sec^2 x \, dx$ . [4]

(ii) Hence find  $\int x \tan^2 x \, dx$ . [3]

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#### Q3, (Jan 2007, Q2)

Find the exact value of  $\int_1^2 x \ln x \, dx$ . [5]

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#### Q4, (Jun 2007, Q2)

Find the exact value of  $\int_0^1 x^2 e^x \, dx$ . [6]

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#### Q5, (Jan 2010, Q8)

(i) State the derivative of  $e^{\cos x}$ . [1]

(ii) Hence use integration by parts to find the exact value of

$$\int_0^{\frac{1}{2}\pi} \cos x \sin x e^{\cos x} \, dx. \quad [6]$$

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#### Q6, (Jun 2010, Q9i)

Find  $\int (x + \cos 2x)^2 \, dx$ . [9]

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#### Q7, (Jun 2013, Q2)

Find  $\int x^8 \ln(3x) \, dx$ . [5]

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#### Q8, (Jun 2014, Q8)

(i) Use division to show that  $\frac{t^3}{t+2} \equiv t^2 - 2t + 4 - \frac{8}{t+2}$ . [3]

(ii) Find  $\int_1^2 6t^2 \ln(t+2) \, dt$ . Give your answer in the form  $A + B \ln 3 + C \ln 4$ . [6]

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#### Q9, (Jun 2016, Q4)

Find the exact value of  $\int_1^8 \frac{1}{\sqrt[3]{x}} \ln x \, dx$ , giving your answer in the form  $A \ln 2 + B$ , where  $A$  and  $B$  are constants to be found. [5]

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