How to get marks for Integration by Parts questions

1. $u =$ and $\frac{du}{dx} =$
2. $\frac{dv}{dx} =$ and $v =$
3. Correct substitution of (your) terms into parts formula
4. Correct integration and correct final answer

(Note that there may be more marks available if question is more complicated)

How to get marks for Integration by Parts Questions

Question	$\int x^2 e^{-\frac{x}{4}}\,dx$	$\int xe^{6x}\,dx$	$\int (lnx)^2\,dx$	$\int x^2 sin2x\,dx$	$\int xsec^2 x\,dx$
$u =$ and $\frac{du}{dx} =$					
$\frac{dv}{dx} =$ and $v =$					
Correct substitution of (your) terms into parts formula					
Correct integration and correct final answer					
Exam Paper Ref.	AQA Jan 12 (7bi)	AQA June 12 (4a)	AQA June 13 (10aii)	AQA June 14 (6a)	AQA June 15 (5b)

How to get marks for Integration by Parts Questions - Answers

Question	$\int x^2 e^{-\frac{x}{4}}\,dx$	$\int xe^{6x}\,dx$	$\int (lnx)^2\,dx$	$\int x^2 sin2x\,dx$	$\int xsec^2x\,dx$
$u =$ and $\frac{du}{dx} =$	$u = x^2, \quad \frac{du}{dx} = 2x$ Then $u = 2x, \quad \frac{du}{dx} = 2$	$u = x$ $\frac{du}{dx} = 1$	$u = (lnx)^2, \frac{du}{dx} = \frac{2lnx}{x}$ Or $u = lnx, \frac{du}{dx} = \frac{1}{x}$	$u = x^2, \quad \frac{du}{dx} = 2x$ Then $u = 2x, \quad \frac{du}{dx} = 2$	
$\frac{dv}{dx} =$ and $v =$	$\frac{dv}{dx} = e^{-\frac{x}{4}}, v = -4e^{-\frac{x}{4}}$ Then $\frac{dv}{dx} = e^{-\frac{x}{4}}, v = -4e^{-\frac{x}{4}}$	$\frac{dv}{dx} = e^{6x}$ $v = \frac{1}{6}e^{6x}$	$\frac{dv}{dx} = 1, \quad v = x$ Or $\frac{dv}{dx} = lnx, v = xlnx - x$	$\frac{dv}{dx} = sin2x$ $v = -\frac{1}{2}cos2x$	
Correct substitution of (your) terms into parts formula	$-4x^2e^{-\frac{x}{4}} - \int -8xe^{-\frac{x}{4}}\,dx$ Then $-4x^2e^{-\frac{x}{4}} + 8\left[-8xe^{-\frac{x}{4}} - \int -8e^{-\frac{x}{4}}dx\right]$	$x(lnx)^2 - \int 2lnx\,dx$	$x(lnx)^2 - xlnx - \int lnx - 1dx$ Or $x(lnx)^2 - \int 2lnx\,dx$		
Correct integration and correct final answer	$-4x^2e^{-\frac{x}{4}} - 32xe^{-\frac{x}{4}} - 128e^{-\frac{x}{4}}$ $+C$	$\frac{1}{6}xe^{6x} - \frac{1}{36}e^{6x}$ $+C$	$x(lnx)^2 - 2xlnx + 2x$ $+C$	$\frac{-x^2cos2x}{2} + \frac{xsin2x}{2} + \frac{cos2x}{4}$ $+C$	$xtanx - ln(secx)$ $+C$
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