



Pure Year 1 Edexcel

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Ch. 1: Algebraic Expressions

November 2021 Question 2

2. In this question you should show all stages of your working.
Solutions relying on calculator technology are not acceptable.

Given

$$\frac{9^{x-1}}{3^{y+2}} = 81$$

express y in terms of x , writing your answer in simplest form.

(3)

ANSWER

Question	Scheme	Marks	AOs
2	$\frac{9^{x-1}}{3^{y+2}} = 81 \Rightarrow \frac{3^{2x-2}}{3^{y+2}} = 3^4$ or $\frac{9^{x-1}}{3^{y+2}} = 81 \Rightarrow \frac{9^{x-1}}{9^{\frac{1}{2}(y+2)}} = 9^2$	M1	1.1b
	$\Rightarrow 2x - 2 - y - 2 = 4 \Rightarrow y =$ or $\Rightarrow x - 1 - \frac{1}{2}y - 1 = 2 \Rightarrow y =$	dM1	1.1b
	$\Rightarrow y = 2x - 8$	A1	1.1b
		(3)	
Alt	Eg. $\log_3\left(\frac{9^{x-1}}{3^{y+2}}\right) = \log_3 81$	M1	1.1b
	$\Rightarrow (x-1)\log_3(9^{x-1}) - (y+2)\log_3(3^{y+2}) = 4$ $\Rightarrow 2(x-1) - y - 2 = 4 \Rightarrow y =$	dM1	1.1b
	$\Rightarrow y = 2x - 8$	A1	1.1b
			(3 marks)

June 2019 Question 1 Paper 2 (A-Level)

1. Given

$$2^x \times 4^y = \frac{1}{2\sqrt{2}}$$

express y as a function of x .

(3)

ANSWER

Way 1	$2^x \times 2^{2y} = 2^{-\frac{3}{2}}$	B1	1.1b
	$2^{x+2y} = 2^{-\frac{3}{2}} \Rightarrow x+2y = -\frac{3}{2} \Rightarrow y = \dots$	M1	2.1
	E.g. $y = -\frac{1}{2}x - \frac{3}{4}$ or $y = -\frac{1}{4}(2x+3)$	A1	1.1b
		(3)	
Way 2	$\log(2^x \times 4^y) = \log\left(\frac{1}{2\sqrt{2}}\right)$	B1	1.1b
	$\log 2^x + \log 4^y = \log\left(\frac{1}{2\sqrt{2}}\right)$ $\Rightarrow x \log 2 + y \log 4 = \log 1 - \log(2\sqrt{2}) \Rightarrow y = \dots$	M1	2.1
	$y = \frac{-\log(2\sqrt{2}) - x \log 2}{\log 4} \left\{ \Rightarrow y = -\frac{1}{2}x - \frac{3}{4} \right\}$	A1	1.1b
		(3)	