Question	Scheme	Marks	AOs
5	$15-2^{x+1}=3\times 2^{x}$	B1	1.1b

	$\Rightarrow 15-2\times 2^x=3\times 2^x \Rightarrow 2^x=3$ or e.g. $\Rightarrow \frac{15}{2^x}-2=3\Rightarrow 2^x=3$	M1	1.1b
	$2^x=3\Rightarrow x=...$	dM1	1.1b
	$x=\log_2 3$	A1cso	1.1b
		(4)	
	Alternative		
	$y=3\times 2^x \Rightarrow 2^x=\frac{y}{3}\Rightarrow y=15-2\times\frac{y}{3}$	B1	1.1b
	$3y+2y=45\Rightarrow y=9\Rightarrow 3\times 2^x=9\Rightarrow 2^x=3$	M1	1.1b
	$2^x=3\Rightarrow x=...$	dM1	1.1b
	$x=\log_2 3$	A1cso	1.1b
			(4 marks)

Notes:

B1: Combines the equations to reach $15-2^{x+1}=3\times 2^x$ or equivalent e.g. $15-2^{x+1}-3\times 2^x=0$

M1: Uses $2^{x+1}=2\times 2^x$ oe e.g. $\frac{2^{x+1}}{2^x}=2$ to obtain an equation in 2^x and attempts to make 2^x the subject.

See scheme but e.g. $y=2^x \Rightarrow 3\times 2^x=15-2^{x+1}\Rightarrow 3y=15-2y\Rightarrow y=...$ is also possible

dM1: Uses logs correctly and proceeds to a value for x from an equation of the form $2^x=k$ where $k>1$

e.g. $2^x=k\Rightarrow x=\log_2 k$

or $2^x=k\Rightarrow \log 2^x=\log k\Rightarrow x\log 2=\log k\Rightarrow x=...$

or $2^x=k\Rightarrow \ln 2^x=\ln k\Rightarrow x\ln 2=\ln k\Rightarrow x=...$

Depends on the first method mark

This may be implied if they go straight to decimals e.g. $2^x = 3$ so $x = 1.584..$ but you may need to check

A1cso: $x=\log_2 3$ or $\frac{\log 3}{\log 2}$ or $\frac{\ln 3}{\ln 2}$

Ignore any attempts to find the y-coordinate

Alternative

B1: Correct equation in y

M1: Solves their equation in y and attempts to make 2^x the subject.

dM1: Uses logs correctly and proceeds to a value for x from an equation of the form $2^x=k$ where $k>1$

e.g. $2^x=k\Rightarrow x=\log_2 k$

or $2^x=k\Rightarrow \log 2^x=\log k\Rightarrow x\log 2=\log k\Rightarrow x=...$

or $2^x=k\Rightarrow \ln 2^x=\ln k\Rightarrow x\ln 2=\ln k\Rightarrow x=...$

Depends on the first method mark

This may be implied if they go straight to decimals e.g. $2^x = 3$ so $x = 1.584..$ but you may need to check

A1cso: $x=\log_2 3$ or $\frac{\log 3}{\log 2}$ or $\frac{\ln 3}{\ln 2}$

Ignore any attempts to find the y-coordinate