

Question	Scheme	Marks	AOs
5(a)	Substitutes $t = 0.5$ into $m = 25e^{-0.05t} \Rightarrow m = 25e^{-0.05 \times 0.5}$	M1	3.4
	$\Rightarrow m = 24.4\text{g}$	A1	1.1b
		(2)	
(b)	States or uses $\frac{d}{dt}(e^{-0.05t}) = \pm C e^{-0.05t}$	M1	2.1
	$\frac{dm}{dt} = -0.05 \times 25e^{-0.05t} = -0.05m \Rightarrow k = -0.05$	A1	1.1b
		(2)	

(4 marks)

Notes:

(a)

M1: Substitutes $t = 0.5$ into $m = 25e^{-0.05t} \Rightarrow m = 25e^{-0.05 \times 0.5}$

A1: $m = 24.4\text{g}$ An answer of $m = 24.4\text{g}$ with no working would score both marks

(b)

M1: Applies the rule $\frac{d}{dt}(e^{kx}) = k e^{kx}$ in this context by stating or using $\frac{d}{dt}(e^{-0.05t}) = \pm C e^{-0.05t}$

A1: $\frac{dm}{dt} = -0.05 \times 25e^{-0.05t} = -0.05m \Rightarrow k = -0.05$