Question Number	Answer		Mark
15	Log expansion of $R = R_0 e^{-\mu x}$	(1)	
	μ identified as (-) gradient	(1)	
	Gradient calculated	(1)	
	Use of $R = R_0 e^{-\mu x}$ **Or** use $x_{½} = \frac{\ln 2}{\mu}$	(1)	
	Half-value thickness = 1.5 cm	(1)	
	Conclusion consistent with half-value thickness		
	OR		
	Log expansion of $R = R_0 e^{-\mu x}$	(1)	
	ln R_0 identified as intercept	(1)	
	Intercept read from graph	(1)	
	$R_0/2$ calculated and x read from graph	(1)	
	Half-value thickness = 1.5 cm	(1)	
	Conclusion consistent with half-value thickness	(1)	**(6)**
	Example of calculation		
	$\ln R = \ln R_0 - \mu x$		
	$\mu = -\left(\frac{5.20 - 6.85}{3.5 \text{ cm}}\right) = 0.471 \text{ cm}^{-1}$		
	$\frac{R_0}{2} = R_0 e^{-0.471 \text{ cm}^{-1} x}$		
	$\therefore \ln 2 = 0.471 \text{ cm}^{-1} x$		
	$\therefore x = 1.47 \text{ cm}$		
	Total for Question 15		**6**