Question	Scheme	Marks	AOs
6(a)	$$\frac{1}{2}a$$	B1	2.2a
		(1)	
(b)	$\log_2 x(x+8) \Rightarrow \log_2 x + \log_2(x+8)$	M1	1.2
	$= a+b$	A1	2.2a
		(2)	
(c)	e.g. $8 + \dfrac{64}{x} = \dfrac{8x+64}{x}$	B1	1.1b
	$\log_2 \dfrac{8}{x}(x+8) = 3 - \log_2 x + \log_2(x+8)$	M1	1.1b
	$3+b-a$	A1	2.2a
		(3)	
		(6 marks)	

Notes

Condone omission of base 2 in all parts. If they work in any other base then send to review.

(a)

B1: $\dfrac{1}{2}a$ or $\dfrac{a}{2}$ or $0.5a$ isw

(b)

M1: Takes a factor of x out of the bracket to achieve $\log_2 x(x+8)$ and attempts to apply the addition law of logs, usually leading to $\log_2 x + \log_2(x+8)$. Condone missing brackets or omission of base 2.

May be implied by a correct answer. Allow this mark to be scored if they write $\log_2 x + \log_2 x + \log_2 8$ (an answer of $2a+3$ can score M1A0)

$\log_2 x \times \log_2(x+8)$ on its own is M0 but allow the mark to be scored if they proceed to $a+b$

A1: $a+b$ or simplified equivalent (a correct answer with no incorrect log work seen scores M1A1) isw

Note $\log_2 x \times \log_2(x+8) = a+b$ is M1A0 (allow the answer to imply the correct method but withhold the final mark)

(c)

B1: Writes $8 + \dfrac{64}{x}$ as a single fraction e.g. $\dfrac{8x+64}{x}$ or $\dfrac{8}{x}(x+8)$ or $8x^{-1}(x+8)$ or $8\left(\dfrac{x^2+8x}{x^2}\right)$ which

may be implied by later work e.g. $\log_2 8 - \log_2 x + \log_2(x+8)$

M1: Attempts to apply the laws of logs, uses $\log_2 8 = 3$ and proceeds to $3 \pm \log_2 x \pm \log_2(x+8)$

(or equivalent since $\pm \log_2 x$ may appear as $\pm \log_2 \dfrac{1}{x}$ or $\pm \log_2 x^{-1}$)

May be implied by $3 \pm b \pm a$ and condone invisible brackets around $x+8$ and condone the omission of base 2.

Note that if they write $\log_2(x+8)$ as $\log_2 x + \log_2 8$ this is M0

A1: $3+b-a$ or simplified equivalent (a correct answer with no incorrect log work seen is B1M1A1) isw

Note $\log_2 \dfrac{8}{x}(x+8) = 3 \div \log_2 x \times \log_2(x+8) \Rightarrow 3 - a + b$ is B1M1A0 (allow the answer to imply the

correct method but withhold the final mark)

Note: You may see attempts to work backwards to the answer. If these do not result in the correct answer but you think they are creditworthy then send to review.