Question number	Scheme	Marks
8 (a)	$\log_a n = \log_a 3(2n-1)$	M1
	$n = 3(2n-1)$	M1
	$n = \frac{3}{5}$	A1 (3)
(b)(i)	$x = p^3$	B1 (1)
(b)(ii)	$\log_p y - \log_p 2^3 = 4 \Rightarrow \log_p\left(\frac{y}{2^3}\right) = 4$ or $\log_p\left(\frac{y}{8}\right) = 4$	M1
	$\frac{y}{2^3} = p^4 \Rightarrow \left(y = 2^3 p^4 \text{ or } 8p^4\right)$	M1
	$xy = 8p^7$	M1A1 (4)
	ALT (b)(ii)	
	$\log_p x + \log_p y - 3\log_p 2 = 4 + 3 \Rightarrow \log_p\left(\frac{xy}{2^3}\right) = 7$	{M1}
	$\frac{xy}{2^3} = p^7$	{M1}
	$xy = 8p^7$	{M1A1} (4)
		Total 8 marks

Part	Mark	Notes
(a)	**M1**	Uses the addition law of logs correctly $\log_a n = \log_a 3 + \log_a (2n-1) \Rightarrow \log_a n = \log_a 3(2n-1)$ Accept also $\log_a n = \log_a 3 + \log_a (2n-1) \Rightarrow 0 = \log_a \left(\frac{n}{3(2n-1)} \right) = (\log_a 1)$
	M1	For obtaining a linear equation from their log equation and attempting to find a value for *n*. $n = 3(2n-1)$ leading to a numerical value for *n*
	A1	For $n = \frac{3}{5}$
(b)(i)	**B1**	For $x = p^3$
(b)(ii)	**M1**	For stating that $3\log_p 2 = \log_p 8$ or $\log_p 2^3$ and for using the addition law correctly to combine the LHS: $\log_p y - \log_p 2^3 = 4 \Rightarrow \log_p \left(\frac{y}{2^3} \right) = 4$ or $\log_p \left(\frac{y}{8} \right) = 4$
	M1	Correctly removes logs on both sides to obtain: $\frac{y}{2^3} = p^4 \Rightarrow \left(y = 2^3 p^4 \text{ or } 8p^4 \right)$
	M1	For correctly finding the product of their *x* and their *y*: $xy = '\,p^3\,' \times '\,8p^4\,'$
	A1	For the correct answer of $xy = 8p^7$
	ALT	
	M1	For stating that $3\log_p 2 = \log_p 8$ or $\log_p 2^3$ and states $\log_p x + \log_p y - 3\log_p 2 = 3 + 4$ Uses the addition law correctly to combine the LHS $\log_p x + \log_p y - 3\log_p 2 = 4 + 3 \Rightarrow \log_p \left(\frac{xy}{2^3} \right) = 7$
	M1	Correctly remove logs on both sides to obtain: $\frac{xy}{2^3} = p^7$
	M1	Correctly rearrange their expression to make *xy* the subject
	A1	For the correct answer of $xy = 8p^7$