Question	Answer	Marks	Guidance
1(a)	$-3 < x < 1 \quad x > 5$	**B1**	
1(b)	$-\frac{1}{3}(x+3)(x-1)(x-5)$	**3**	**B1** for a negative cubic function **B1** for a cubic function multiplied by $\frac{1}{3}$ **B1** for $(x+3)(x-1)(x-5)$
2(a)	$a = \frac{10}{3}$ or $3\frac{1}{3}$	**B1**	
	$b = \frac{7}{3}$ or $2\frac{1}{3}$	**B1**	
	$c = \frac{9}{2}$ or $4\frac{1}{2}$ or 4.5	**B1**	
2(b)	$10(2^p)^2 - 17(2^p) + 3 = 0$ $(5(2^p) - 1)(2(2^p) - 3) = 0$ $2^p = \frac{1}{5}, \ 2^p = \frac{3}{2}$	**M1**	For recognition of a quadratic in 2^p, attempt to factorise and solve for 2^p
	$p = \frac{\ln \frac{1}{5}}{\ln 2}$ or $p = \frac{\ln 1.5}{\ln 2}$ oe	**M1**	For correct attempt to deal with $2^p = k$
	−2.32	**A1**	
	0.585	**A1**	
3(a)	$\lg \frac{1000a^2}{b^4}$	**4**	**B1** for $3 = \lg 1000$ **B1** for use of power rule once **B1** for use of addition or subtraction rule once **B1** All correct

Question	Answer	Marks	Guidance
3(b)	**Either** $3\log_a 4 = \dfrac{3}{\log_4 a}$	**B1**	
	$2(\log_4 a)^2 - 7\log_4 a + 3 = 0$ $(2\log_4 a - 1)(\log_4 a - 3) = 0$ $\log_4 a = \dfrac{1}{2}$ or $\log_4 a = 3$	**M1**	For obtaining a quadratic equation and solution
	$a = 4^{\frac{1}{2}}$ or $a = 4^3$	**M1**	**Dep** For dealing with the logarithm correctly once, may be implied by a correct solution
	64	**A1**	
	2	**A1**	
	Or $2\log_4 a = \dfrac{2}{\log_a 4}$	**(B1)**	
	$3(\log_a 4)^2 - 7\log_a 4 + 2 = 0$ $(3\log_a 4 - 1)(\log_a 4 - 2) = 0$ $\log_a 4 = \dfrac{1}{3}$ or $\log_a 4 = 2$	**(M1)**	For obtaining a quadratic equation and solution
	$a^{\frac{1}{3}} = 4$ or $a^2 = 4$	**(M1)**	**Dep** For dealing with the logarithm correctly once, may be implied by a correct solution
	64	**(A1)**	
	2	**(A1)**	
4	$\tan\left(2x + \dfrac{\pi}{3}\right) = \dfrac{1}{\sqrt{3}}$	**B1**	
	$x = -\dfrac{7\pi}{12}, -\dfrac{\pi}{12}, \dfrac{5\pi}{12}, \dfrac{11\pi}{12}$	**3**	**M1** for using correct order of operations **A1** for two correct solutions **A1** for two further correct solutions and no other solutions in range