2311
4PM1 Paper 2
Mark Scheme

Question	Scheme	Marks
1	$b^2 - 4ac > 0 \Rightarrow 8^2 - 4 \times k \times 3k > 0$	M1
	$64 - 12k^2 > 0$	
	cvs: $k = \pm\sqrt{\dfrac{64}{12}} = \left[\pm\dfrac{4\sqrt{3}}{3}\right]$ or $\left[\pm\dfrac{4}{\sqrt{3}}\right]$	M1A1
	$\Rightarrow -\dfrac{4\sqrt{3}}{3} < k < \dfrac{4\sqrt{3}}{3}$	M1A1 [5]
		Total 5 marks

Mark	Notes
M1	Applies the correct values, with the correct inequality to $b^2 - 4ac > 0$
M1	Attempts to find two critical values by solving the quadratic equation, which must be of the form $k^2 = $ constant [oe] using a correct method. Accept as a minimum solution $k = \pm\sqrt{\text{constant}}$ Allow simplified or unsimplified. Ignore any inequalities, equal signs etc
A1	For the correct critical values simplified or unsimplified Award this mark for correct critical values. Ignore $=, <, >$ or even $\leqslant, \geqslant$ M0M1A1 is a possible marking pattern.
M1	Simplifies the critical values to the required form and writes down the **inside** region for **their TWO** critical values. If they solve a linear equation for k this mark is not available. Allow use of x for this mark and also allow $\leqslant$ in place of $<$.
A1	For the correct region specified correctly in either of the two forms specified in terms of k. That is, a continuous inside region. Accept $-\dfrac{4}{\sqrt{3}} < k < \dfrac{4}{\sqrt{3}}$ oe Accept also for example $k > -\dfrac{4}{\sqrt{3}}$ AND $k < \dfrac{4}{\sqrt{3}}$