Leave blank

8. The equation $x^2 + (k-3)x + (3-2k) = 0$, where k is a constant, has two distinct real roots.

(a) Show that k satisfies

$$k^2 + 2k - 3 > 0$$

(3)

(b) Find the set of possible values of k.

Mark Scheme on Next Page

(4)

Question Number	Scheme	Marks
8 .		
(a)	$b^2 - 4ac = (k-3)^2 - 4(3-2k)$	M1
	$k^2 - 6k + 9 - 4(3-2k) > 0$ or $(k-3)^2 - 12 + 8k > 0$ or better	M1
	$\underline{k^2 + 2k - 3 > 0}$ *	A1cso
		(3)
(b)	$(k+3)(k-1)[=0]$	M1
	Critical values are $k = 1$ or -3	A1
	(choosing "outside" region)	M1
	$\underline{k > 1 \text{ or } k < -3}$	A1 cao
		(4)
		7
	Notes	
(a)	1st M1 for attempt to find $b^2 - 4ac$ with one of b or c correct 2nd M1 for a correct inequality symbol and an attempt to expand. A1cso no incorrect working seen	
(b)	1st M1 for an attempt to factorize **or** solve leading to k = (2 values) 2nd M1 for a method that leads them to choose the "outside" region. Can follow through their critical values. 2nd A1 Allow "," instead of "or" $\underline{\geq}$ loses the final A1 $1 < k < -3$ scores M1A0 unless a correct version is seen before or after this one.	