Question	Answer	Marks	AO	Guidance
4	**DR** e.g. $\frac{\sqrt{2}-1}{(\sqrt{2}+1)(\sqrt{2}-1)}$	**M1**	**3.1a**	Rationalising denominators At least one example of multiplying by e.g. $\frac{\sqrt{2}-1}{\sqrt{2}-1}$
	$\frac{\sqrt{2}-1}{2-1}+\frac{\sqrt{3}-\sqrt{2}}{3-2}+\frac{2-\sqrt{3}}{4-3}$ $2-1=1$	**A1**	**1.1**	Convincing completion including all steps including the denominators of 1 or better
	Alternative method			
	$\frac{(\sqrt{3}+\sqrt{2})(2+\sqrt{3})+(\sqrt{2}+1)(2+\sqrt{3})+(\sqrt{2}+1)(\sqrt{3}+\sqrt{2})}{(\sqrt{2}+1)(\sqrt{3}+\sqrt{2})(2+\sqrt{3})}$ $\frac{\sqrt{3}+3+2\sqrt{2}+\sqrt{6}+2\sqrt{2}+\sqrt{6}+2+\sqrt{3}+\sqrt{6}+2+\sqrt{3}+\sqrt{2}}{(\sqrt{6}+2+\sqrt{3}+\sqrt{2})(2+\sqrt{3})}$ $\frac{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}{2\sqrt{6}+\sqrt{18}+4+2\sqrt{3}+2\sqrt{3}+3+2\sqrt{2}+\sqrt{6}}$			
	$\frac{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}{3\sqrt{6}+4\sqrt{3}+3\sqrt{2}+2\sqrt{2}+7}$	**M1**		Putting over a common denominator and simplifying all like terms
	$\frac{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}=1$	**A1**		Convincing completion including all steps
		[2]		

Q4. This is a DR question. There are two solutions possible. The first is to rationalise the denominators. To score the M1 we want to see at least one fraction multiplied by the correct fraction $\frac{\sqrt{2}-1}{\sqrt{2}-1}$ *or* $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ *or* $\frac{2-\sqrt{3}}{2-\sqrt{3}}$.

To score the A1 it must be all correct with the denominators seen as 2-1, 3-2, 4-3 or 1,1,1. There must be something there. This leads to the final answer of 1.

The second method is where they try to combine all three fractions. The M1 is given attempting to find a numerator of $(\sqrt{3}+\sqrt{2})(2+\sqrt{3})+(\sqrt{2}+1)(2+\sqrt{3})+(\sqrt{2}+1)(\sqrt{3}+\sqrt{2})$ all multiplied out to $3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7$ and a denominator of $(\sqrt{2}+1)(\sqrt{3}+\sqrt{2})(2+\sqrt{3})$ multiplied out to $3\sqrt{6}+4\sqrt{3}+3\sqrt{2}+2\sqrt{2}+7$.

The A1 is for getting the correct fraction $\frac{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}{3\sqrt{6}+4\sqrt{3}+5\sqrt{2}+7}$ before cancelling and getting the answer 1.