

STEP III, 2006, Q3 MS

3 (i)	<p>$\tan x$ is an odd function. Express both sides in terms of $\tan x$. From identity, substitute series and result follows by equating coefficients of powers of x.</p>
(ii)	Show that $\cot x + \tan x = 2 \operatorname{cosec} 2x$ and follow same method.
(iii)	<p>Identity follows from $1 + \cot^2 x = \operatorname{cosec}^2 x$. Equate coefficients to show that all coefficients for even n are zero, and $a_1 = 1, a_3 = \frac{1}{3}$.</p>



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