



STEP II, 1998, Q4

- 4 The integral I_n is defined by

$$I_n = \int_0^{\pi} (\pi/2 - x) \sin(nx + x/2) \operatorname{cosec}(x/2) dx,$$

where n is a positive integer. Evaluate $I_n - I_{n-1}$, and hence evaluate I_n leaving your answer in the form of a sum.



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