

## MATHEMATICS PROBLEM 128

- a. How many sequences of ten positive integers sum to a thousand?
- b. How many sequences of ten nonnegative integers sum to a thousand?

(For example, 84 sequences of four positive integers sum to ten. Three examples of such sequences are  $(1,2,5,2)$ ,  $(2,2,5,1)$ , and  $(1,2,3,4)$ .)

Each midshipman submitting a correct solution with a correct explanation to both parts a and b of Problem 128 by 1700 Friday 31 January 2003 will win a cookie. Submit solutions to Prof. Wardlaw at [mathprob@usna.edu](mailto:mathprob@usna.edu) (please no attachments!).

A correct solution to Mathematics Problem 127 was submitted by Mdn Lawrence A. Herman. My solution to Mathematics Problem 127 is posted on the board and is on the reverse side of this sheet.

### Mathematics Problem 127

Evaluate by hand (without calculator or computer) the following iterated integral, showing every step in detail to obtain an exact value, not a numerical approximation!

**Solution.** To evaluate by converting to polar coordinates:

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