to give:

$$G(r) = 1 - \left\{\frac{A - \pi r^2}{A}\right\}^{m-1},$$

$$G'(r) = \frac{2\pi r}{A}(m-1)\left\{\frac{A - \pi r^2}{A}\right\}^{m-2},$$

$$E(d) = \int_0^\rho rG'(r)\,dr = \frac{1}{2}\sqrt{\frac{A}{\pi}}\,[B(m, \tfrac{1}{2})],$$

where $B(m, \frac{1}{2})$ is the complete Beta function.
Since $\sqrt{m}\,[B(m, \frac{1}{2})] \geq \sqrt{\pi}$:

$$E(d) \geq \frac{1}{2}\sqrt{\frac{A}{m}}.$$

Thus, we have:

$$E(L) \geq \tfrac{1}{2}\sqrt{A}\,\frac{m-1}{\sqrt{m}}.$$

It is obvious that the development is general and applies to m random points in any bounded two-dimensional Borel set. However, the lower bound obtained will, in general, be useful only when S is a connected region.

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A MATRIX ARISING IN CORRELATION THEORY[1]

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1. Introduction. In the study of time series, it is frequently desirable to consider correlations between observations made in different years. Let x_{i1}, $x_{i2}, \cdots, x_{im}$ be m values of the variable x_i, expressed as deviations from their arithmetic mean, where x_i is a variable observed in the ith year ($i = 1, 2, \cdots, n$).

[1] A linear correlogram is considered by Cochran in his paper, "Relative accuracy of systematic and stratified random samples for a certain class of populations," (*Annals of Math. Stat.*, Vol. 17 (1946), pp. 164–177) in which $\rho_\mu = 1 - \frac{\mu}{L}$. Setting $\mu = |i - j|$ and $L = 1/p$, we have the case considered above.

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