$$+8nr[(\tfrac{3}{2}r^2+2cr-ac-c^2)\cos^{-1}\left(\frac{c}{r}\right)+(a-2r-c)\sqrt{(r^2-c^2)}]$$

$$+8nr[(\tfrac{3}{2}r^2+2cr-bc-c^2)\cos^{-1}\left(\frac{c}{r}\right)+(b-2r-c)\sqrt{(r^2-c^2)}]$$

$$=2\pi r[ab-(a-2r)(b-2r)]+8nr[(3r^2+4cr-(a+b)c-2c^2)$$

$$\cos^{-1}\left(\frac{c}{r}\right)+(a+b-4r-2c)\sqrt{(r^2-c^2)}].$$

Let S be the number of rectangles, ab, then the probability required is, $P=Sn_4\div 2\pi rSab=n_4\div 2\pi rab=\{\ \pi[ab-(a-2r)(b-2r)+4n[(3r^2+4cr$

$$-(a+b)c-2c^2)\cos^{-1}\left(\frac{c}{r}\right)+(a+b-4r-2c)\sqrt{(r^2-c^2)}]\ \}\div\pi ab.$$

PROBLEMS.

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24. Proposed by F. P. MATZ, M. Sc. Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

The average area of the triangle formed by three perpendiculars drawn from the sides of the triangle (a, b, c), is $\mathbf{A}=(a^4+b^4+c^4)/48\triangle$.

25. Proposed by G. B. M. ZERR, Principal of High School, Staunton, Virginia.

The probability that the distance of two points taken at random in a given convex area A shall exceed a given limit (a) is

$$\triangle=\frac{1}{3A^2}\int\!\!\int(C^3-3a^2C+2a^3)dpd\theta,$$

where C is a chord of the area, whose co-ordinates are p, θ; the integration extending to all values of p, θ, which give a chord $C>a$. What is $\triangle$ when the area is a circle? If in the circle $a=r=$radius $\triangle=\dfrac{3\sqrt{3}}{4\pi}$.

INFORMATION.

PROFESSOR ARTHUR CAYLEY DEAD.

The Distinguished English Mathematician Passes Away at Cambridge.

LONDON, Jan. 31.—Prof. Arthur Cayley, of the University of Cambridge, died to-day, in the seventy-fourth year of his age. He had been for thirty-two years Sadlerian professor of pure mathematics at Cambridge, and