of intersection of the pair of lines and the circumscribed conic, or, what is the same thing, the points of intersection of the circumscribed conic and the conics enveloped by the other two sides.

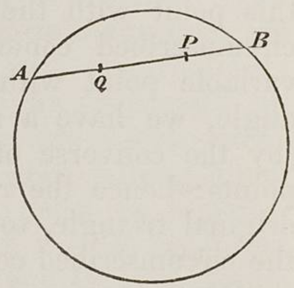
2, Stone Buildings, *Oct.* 2, 1856.

GEOMETRICAL THEOREM.

By Rev. HAMNET HOLDITCH.

IF a chord of a closed curve, of constant length $c+c'$, be divided into two parts of lengths c, c' respectively, the difference between the areas of the closed curve, and of the locus of the dividing point, will be $\pi cc'$.

Solution. Let AB be the chord in any position; P the dividing point, so that $AP=c$, $BP=c'$; let Q be the point in which the chord intersects its consecutive position; let $[A]$ be the area of the given curve, $[P]$, $[Q]$, those of the loci of P, Q, respectively; $AQ=r$, $BQ=c+c'-r$.



Then $$[A]-[Q]=\tfrac{1}{2}\int_0^{2\pi} r^2 d\theta \ldots\ldots\ldots\ldots\ldots\ldots (1),$$

but also $$[A]-[Q]=\tfrac{1}{2}\int_0^{2\pi} (c+c'-r)^2\, d\theta;$$

therefore $$\tfrac{1}{2}\int_0^{2\pi} r^2 d\theta=\tfrac{1}{2}\int_0^{2\pi} (c+c'-r)^2\, d\theta,$$

or $$(c+c')\int_0^{2\pi} r d\theta=\tfrac{1}{2}\int_0^{2\pi} (c+c')^2\, d\theta;$$

therefore $$\int_0^{2\pi} r d\theta=\pi(c+c') \ldots\ldots\ldots\ldots\ldots\ldots (2).$$

Also $$[P]-[Q]=\tfrac{1}{2}\int_0^{2\pi} (c-r)^2\, d\theta,$$

therefore, by (1), $$[A]-[P]=\tfrac{1}{2}\int_0^{2\pi} (2cr-c^2)\, d\theta$$

$$=c\int_0^{2\pi} r d\theta-\pi c^2$$

$$=\pi c(c+c')-\pi c^2, \text{ by (2)},$$

$$=\pi cc'.$$