Theorem. Let $P$, $Q$, and $R$ be three points on a line, with $Q$ lying between $P$ and $R$. Semicircles are drawn on the same side of the line with with diameters $PQ$, $QR$, and $PR$. An arbelos is the figure bounded by these three semicircles. Draw the perpendicular to $PR$ at $Q$, meeting the largest semicircle at $S$. Then the area $A$ of the arbelos equals the area $C$ of the circle with diameter $QS$ [Archimedes, Liber Assumptorum, Proposition 4].

Proof.

\[ A + A_1 + A_2 = B_1 + B_2 \]
\[ B_1 = A_1 + C_1 \]
\[ B_2 + A_2 + C_2 \]

\[ A + A_1 + A_2 = A_1 + C_1 + A_2 + C_2 \]
\[ \therefore A = C_1 + C_2 = C \]

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