P 52. Let n be an integer > 2 and put $\omega = e^{2\pi i/n}$. Show that if f(z) is regular for $|z| < A$ and satisfies the equation

$$(1) \quad \prod_{r=0}^{n-1} f(x_0 + \omega^r x_1 + \dots + \omega^{(n-1)r} x_{n-1})$$

$$= \prod_{r=0}^{n-1} \left\{ f(x_0) + \omega^r f(x_1) + \dots + \omega^{(n-1)r} f(x_{n-1}) \right\} ,$$

where $x_0, x_1, \dots, x_{n-1}$ are arbitrary complex numbers, then $f(z) = az$, where a is some complex constant.

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P 53. For real $\alpha$, $\beta$, $\gamma$, $\delta$ and $(\alpha x + \beta y)(\gamma x + \delta y) = ax^2 + bxy + cy^2$ prove that $\max(a, b, c) \geq 4/9 (\alpha + \beta)(\gamma + \delta)$.

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P 54. Let S be a developable surface,

(i) Prove: If S contains a straight line which is not a generator, S is plane.

(ii) Given a circular arc C, determine those S such that every generator meets C. Suppose S can be mapped into the plane isometrically such that C is mapped into a straight line. Show that S then is a cylinder.

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https://doi.org/10.1017/S0008439500025935 Published online by Cambridge University Press