

## Answer on Question #55967 – Math – Complex Analysis

### Question

Find all  $z$ , such that  $z^{2015} = 321$ .

### Solution

Let  $w = 321$ , then  $\rho = 321, \varphi = 0$ . Then using the formula

$\sqrt[n]{w} = \left\{ \sqrt[n]{\rho} e^{\frac{\varphi + 2\pi k i}{n}}, k = 0, 1, \dots, n - 1 \right\}$  we obtain:

$$z = \sqrt[2015]{321 + i \cdot 0} = \left\{ \sqrt[2015]{321} e^{\frac{2\pi k i}{2015}}, k = 0, 1, \dots, 2014 \right\}, \text{ where } \sqrt[2015]{321} \approx 1.003.$$

**Answer:**  $\left\{ \sqrt[2015]{321} e^{\frac{2\pi k i}{2015}}, k = 0, 1, \dots, 2014 \right\}$ .