Answer on Question #78434 – Math – Complex Analysis

Question

Apply De Moivre's theorem to write (√3+i)^5 in the form a + ib , with a, b∈ R

Solution

$$z = \sqrt{3} + i = 2\left(cos\frac{\pi}{6} + isin\frac{\pi}{6}\right).$$

$$z^5 = 2^5\left(cos\frac{5\pi}{6} + isin\frac{5\pi}{6}\right) = 32\left(-\frac{\sqrt{3}}{2} + \frac{1}{2}i\right) = -16\sqrt{3} + 16i.$$