

請計算 $\frac{[\frac{3}{2}\sqrt{3} + \frac{3}{2}i]^6}{[\sqrt{\frac{5}{2}} + \sqrt{\frac{5}{2}}i]^3}$. [101 海洋光電 3]

[解]原式 = $\frac{[3(\frac{\sqrt{3}}{2} + \frac{1}{2}i)]^6}{[\sqrt{5}(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}i)]^3} = \frac{[3(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6})]^6}{[\sqrt{5}(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4})]^3} = \frac{3^6(\cos \pi + i \sin \pi)}{(\sqrt{5})^3(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4})}$

= $\frac{3^6(-1)}{5\sqrt{5}(-\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}i)} = \frac{-729\sqrt{2}}{5\sqrt{5}(-1+i)} = \frac{729\sqrt{2}(1+i)}{10\sqrt{5}} = \frac{729\sqrt{10}(1+i)}{50}$

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