

### **Extreme Problem 4**

Given that  $Z = 2^{\frac{1}{3}} \left( \cos \frac{\pi}{4} - i \sin \frac{\pi}{4} \right)$ , find the real numbers  $a$  and  $b$  if  $Z^3 + \frac{1}{Z^3} = e^{a+ib}$ .