Problem 1

Let $z = e^{ix}$, explain why $\overline{z} = e^{-ix}$.

Problem 2

Find two different complex numbers, $z_1 = a + bi$ and $z_2 = c + di$, such that $(z_1)^2 = i$ and $(z_2)^2 = i$. The answer is not $\pm\sqrt{i}$. Hint: $(e^{i\theta})^2 = e^{i2\theta}$

Problem 3

Find all the roots of the following polynomial: $x^3 + 4x^2 + 16x + 64$

Problem 4

Show that x, $\sin(x)$ and $\cos(x)$ are linearly independent.