

Question 7**(6 marks)**

(a) Solve the equation $z^3 + 1 = 0$ giving solutions in polar form $r \operatorname{cis} \theta$.

(3 marks)

It can be shown that $P(z) = z^5 - 2z^4 + 5z^3 + z^2 - 2z + 5$ can be written in the form

$$P(z) = (z^3 + 1)Q(z).$$

(b) Determine $Q(z)$.

(1 mark)

- (c) Hence solve the equation $z^5 - 2z^4 + 5z^3 + z^2 - 2z + 5 = 0$ giving all solutions in Cartesian form $a + bi$. (2 marks)