Question 2 **(5 marks)**

$P(z) = z^5 + az^4 + bz^3 + cz^2 + dz + 14$ is a fifth order polynomial with real coefficients. It is known that $P(z) = (z - z_0)\,Q(z)$ where z_0 is real and $Q(z)$ is a fourth order polynomial. Two roots of $P(z)$ are $z_1 = 1 + i$ and $z_2 = 2 + \sqrt{3}i$.

(a) Determine $Q(z)$ in expanded form. (3 marks)

(b) Determine the values of the coefficients a, b, c and d. (2 marks)