## Question 2 ( 8 marks)

Consider the polynomial $P(x)=x^{3}+(a-4) x^{2}+b x+5 a$, where $a$ and $b$ are real constants.
(a) One zero of $P(x)$ is $2+i$.
(i) State one other zero of $P(x)$.

(ii) Hence find a real quadratic factor of $P(x)$.

(b) (i) If the remainder is -40 when $P(x)$ is divided by $(x+1)$, show that $6 a-b=-35$.

(ii) One factor of $P(x)$ is $(x-3)$.

Show that $14 a+3 b=9$.

(iii) Hence find the values of $a$ and $b$.

(1 mark)
(c) Write the polynomial $P(x)$ as a product of a real linear factor and a real quadratic factor.


