Question 2 (8 marks)

Consider the polynomial $P(x) = x^3 + (a-4)x^2 + bx + 5a$, where a and b are real constants.

- (a) One zero of P(x) is 2+i.
 - (i) State *one* other zero of P(x).



(1 mark)

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



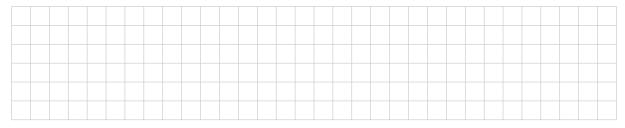
(2 marks)

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



(2 marks)

(ii) One factor of P(x) is (x-3). Show that 14a+3b=9.



(1 mark)

(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.



(1 mark)