1) The expression $6x^3 + ax^2 - (a+1)x + b$ has a remainder of 15 when divided by $x+2$ and a remainder of 24 when divided by $x+1$. Show that $a = 8$ and find the value of b. [5]

2) The expression $x^3 + ax^2 - 15x + b$ has a factor $x - 2$ and leaves a remainder of 75 when divided by $x+3$. Find the value of a and of b. [5]

3) Solve the equation $3x^3 + 7x^2 - 22x - 8 = 0$. [6]

4) The remainder when the expression $x^3 + kx^2 - 5x - 3$ is divided by $x - 2$ is 5 times the remainder when the expression is divided by $x + 1$. Find the value of k. [4]

5) Factorise completely the expression $2x^3 - 11x^2 - 20x - 7$. [5]

6) Solve the equation $2x^3 - 3x^2 - 11x + 6 = 0$. [6]

7) **(i)** Show that $2x - 1$ is a factor of $2x^3 - 5x^2 + 10x - 4$. [2]

(ii) Hence show that $2x^3 - 5x^2 + 10x - 4 = 0$ has only one real root and state the value of this root. [4]

8) The expression $x^3 + 8x^2 + px - 25$ leaves a remainder of R when divided by $x - 1$ and a remainder of $-R$ when divided by $x + 2$.

(i) Find the value of p. [4]

(ii) Hence find the remainder when the expression is divided by $x + 3$. [2]