## Question $9 \quad$ (7 marks)

$P(x)$ is a real cubic polynomial. When $P(x)$ is divided by $(x-1)$, the remainder is 35 , and when it is divided by $(x+2)$, the remainder is 80 .
(a) Find the values of $a$ and $b$ if $P(x)=Q(x)\left(x^{2}+x-2\right)+(a x+b)$.

(b) (i) If $(x-2)$ is a factor of $P(x)$, show that $Q(2)=-5$.

(ii) If the leading coefficient of $P(x)$ is 1 , show that $Q(x)=x-7$.

(2 marks)
(iii) Hence find the expanded form of $P(x)$.


