Question 15 **(5 marks)**

The population of mosquitos, P (in thousands), in an artificial lake in a housing estate is measured at the beginning of the year. The population after t months is given by the function, $P(t) = t^3 + at^2 + bt + 2,\ 0 \leq t \leq 12$.

The rate of growth of the population is initially increasing. It then slows to be momentarily stationary in mid-winter (at $t = 6$), then continues to increase again in the last half of the year.

Determine the values of a and b.