4 The polynomial P is given by $\mathrm{P}(x) = ax^3 + bx^2 + 3x + 2$, where a and b are integers. $\mathrm{P}(x)$ has a factor of $2x + 1$. $\mathrm{P}(x)$ has a remainder of -6 when divided by $x + 1$.

(a) Find the values of a and b. [5]

(b) Show that the equation $\mathrm{P}(x) = 0$ has only one real root. [3]

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