7 The polynomial $p(x)$ is defined by

$$p(x) = 2x^4 + kx^3 + kx^2 + 17x + 18,$$

where k is a constant. It is given that $(x+2)$ is a factor of $p(x)$.

(a) Find the value of k. [2]

It is given that the equation $p(x) = 0$ has exactly two real roots, denoted by α and β, where α is an integer and β is not an integer.

(b) State the value of α and show that β satisfies the equation $x = \sqrt[3]{-2x-4.5}$. [4]

(c) Show by calculation that $-1.4 < \beta < -1.0$. [2]

(d) Use an iterative formula, based on the equation in part **(b)**, to find the value of β correct to 3 significant figures. Give the result of each iteration to 5 significant figures. [3]