11 (a) A student states that 3 is the smallest value of k in the interval $3 < k < 4$

Explain the error in the student's statement.

[1 mark]

11 (b) The student's teacher says there is no smallest value of k in the interval $3 < k < 4$

The teacher gives the following correct proof:

Step 1: Assume there is a smallest number in the interval $3 < k < 4$ and let this smallest number be x

Step 2: let $y = \dfrac{3 + x}{2}$

Step 3: $3 < y < x$ which is a contradiction.

Step 4: Therefore, there is no smallest number in interval $3 < k < 4$

11 (b) (i) Explain the contradiction stated in Step 3

[1 mark]

11 (b) (ii) Prove that there is no largest value of k in the interval $3 < k < 4$

[4 marks]