

The sequence of values given by the iterative formula

$$x_{n+1} = \frac{2x_n^6 + 12x_n}{3x_n^5 + 8},$$

with initial value $x_1 = 2$, converges to α .

- (i) Use the formula to calculate α correct to 4 decimal places. Give the result of each iteration to 6 decimal places. [3]
- (ii) State an equation satisfied by α and hence find the exact value of α . [2]