Exercise 16 solution: Case 2. Suppose $i - k < 0$. Then $\alpha \leq (j-l)/(k-i)$. By Exercise 6, $F^i(x_0) + j < F^k(x_0) + l$ implies $F^i(x_0 + j) < F^k(x_0 + l)$. By Exercise 3 we have $x_0 + j < F^{k-i}(x_0 + l)$, so that $F^{k-i}(x_0) > x_0 + j - l$. As in the solution of Exercise 12, this implies $F^{m(k-i)}(x_0) > x_0 + m(j-l)$ for all integers m. Hence

$$\alpha = \lim_{m \to \infty} \frac{F^{m(k-i)}(x_0) - x_0}{m(k-i)} \geq \frac{j-l}{k-i}.$$

This implies $\alpha = (j-l)/(k-i)$, contradicting the fact α is irrational.