P78, 8

f: A → A is 1-1 & into, c ∈ A - ran f.

h: c → A
h(n) = c, h(n+1) = f(h(n))

(1) suppose \langle x, y \rangle & \langle 3, 5 \rangle ∈ h

(2) h(x) = h(y) = c

(3) since f x = 0 \Rightarrow h(x) = c = h(y) = c = 3 = 0, we can assume x, b ≠ 0

(4) Ex, m ∈ A s.t. x = n+1, b = m+1 & h(x) = f(h(m)) = h(c) = f(h(m))

(5) f(h(m)) = f(h(m)) \Rightarrow h(n) = h(m), since f is 1-1

(6) R.T.S h(m) = h(m) \Rightarrow n = m.

(7) use induction on n.
Base: h(0) = 0 = h(m) \Rightarrow M = 0 since h(m) & c ∈ A.

(8) & higher suppose true for n < k. h(k) = h(m) \Rightarrow k = m.

(9) suppose h(k+1) = h(m)

(10) since m ≠ 0 \Rightarrow m = p for some p ∈ A.

(11) h(k+1) = h(p+1)

(12) f(h(k+1)) = \overline{f(h(p+1))}

(13) h(k) = h(p) since f is 1-1

(14) k = p by ind. hypo.

P89, 38
h: A → A s.t. h(n) = 5n + 2

h(0) = 2, h(n+1) = h(n) + 5

P89, 40
h: A → A s.t. h(n) = 5n + 2

h(0) = 2, h(n+1) = h(n) + 5