

1.11) The plot shows the curve produced by a function that takes an input, the population this year, and returns the population next year as an output.

Lets write the population this year as P_t and the population next year as P_{t+1} .

a)

1999	—>	2000
P_t	—>	P_{t+1}
Pop: 70	—>	90

There are approximately 90 rabbits on the island in 2000

b)

year	2003	—>	2004
iterate	P_t	—>	P_{t+1}
population	35	—>	80

There are approx. 80 rabbits on the island in 2004

c) In 1985 there are 20 rabbits on the island. The following year, the function tells us there will be 65. For an initial population of 65 rabbits, the function tells us there will be 90 rabbits approximately the following year.

year	1985	—>	1986	—>	1987
population	(20)	function	(65)	function	(90)
iterate	P_t	—>	P_{t+1}	—>	P_{t+2}

A) ... Therefore, in 1987, there are 90 rabbits on the island.

d) Here, we are given P_{t+1} and asked to find P_t . We simply check the correspondences from the y-axis to the x-axis. We get 2 intersections of the y-line with the curve, so 2 possible values: 35 and 85 approximately

(d continued)

year	1991	>	1992
population	35 or 85	>	80
iterate	P_t	>	P_{t+1}

^A In 1991, there could have been either approx. 35 or 85 rabbits!