Introduction to Dynamical Systems and Chaos (Winter 2014)
4.8 Test » Unit 4 Test

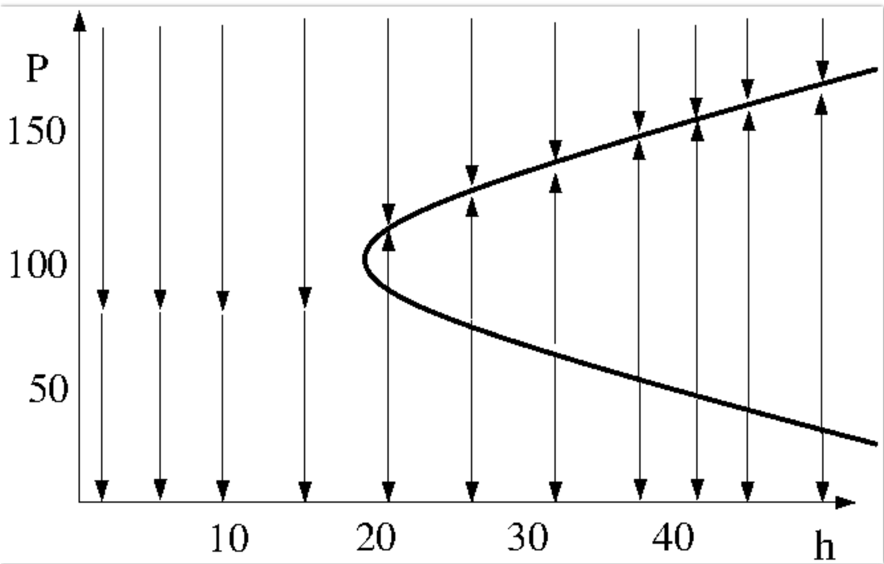
Instructions 1

If the equations in this test do not display properly, please download the pdf version of the test from this link. This file will show the e correctly. Do not click on "Downalod Exam PDF", as this version will not have the equations displayed. We apologize for the inconve

You may use any course materials, videos, websites, calculators, etc. for this test. Just don't ask another person for the answers or s answers with other people. Please do not post questions about the test on the forum. If you have questions, please send them via er chaos@complexityexplorer.org. Thanks.

Question 2

The bifurcation diagram for a differential equation is shown below



Suppose P=200 and h = 30. What would happen to P?

- P would get larger and larger and grow without bound.
- P would decrease to around 140.
- P would decrease to around 70.
- P would decrease to 0.

Question 3

Refer again to the bifurcation diagram shown in Question 1. If P=100 and h=10, what would happen to P?

- P would decrease to 0
- P would remain constant
- P would decrease to 20
- P would get larger and larger and grow without bound.

Question 4

Refer again to the bifurcation diagram shown in Question 1. Suppose P is 150 and h is 40. If h is decreased gradually from 40 to 35, happen to P?

- P would increase gradually
- P would decrease gradually
- P would drop suddenly to 0
- P would increase suddenly

Question 5

Refer again to the bifurcation diagram shown in Question 1. Suppose P is 120 and h is 25. If h is decreased graduatlly frmo 25 to 15, happen?

- P would increase gradually
- P would decrease gradually
- P would drop suddenly to 0
- P would increase suddenly

Question 6

Consider the logistic differential equation:

In this equation, the growth rate is:

- 1
- 2
- 100
- 200

Question 7

Consider again the logistic differential equation given in Question 5. In this equation, the carrying capacity is

- 1
- 2
- 100
- 200

Question 8

Consider again the logistic differential equation given in Question 5. Which of the following statements best describes the phase line differential equation?

- There is an attracting fixed point at 0 and a repelling fixed point at 200
- There is a repelling fixed point at 0 and an attracting fixed point at 200
- There is a repelling fixed point at 20 and an attracting fixed point at 180
- There is a repelling fixed point at 100
- This dynamical system has no fixed points.

Question 9

Consider a differential equation of the form:

$$\frac{dP}{dt} = f(P)$$

where, f(P) is a continuous and smooth function. A solution to this equation is a function P(t). Is it possible for P(t) to oscillate?

- Yes
- No

Question 10

Consider an iterated function f(P), where f(P) is a continous and smooth function of P. Is it possible for orbits of this type of dynamica
be periodic?

- Yes
- No