



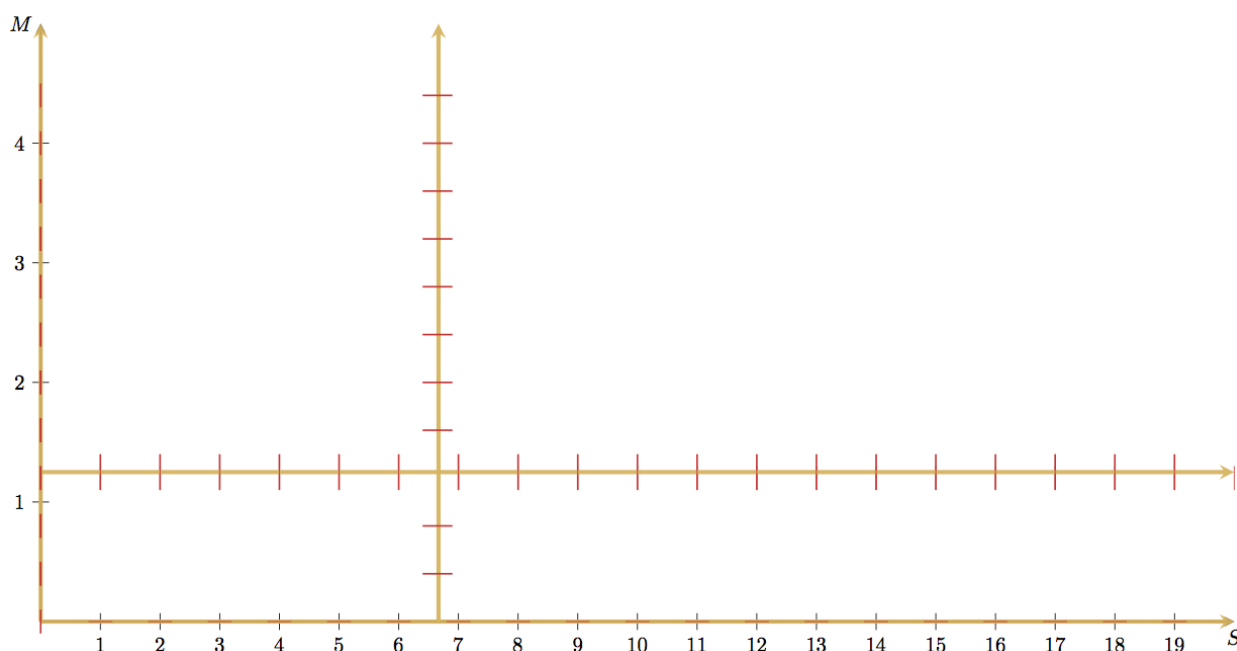
Course > Section 5: Population Dynamics Part I: the Evolution of Population Models >  
 1.4 Volterra's Model in Action: Marlin and Sardines > 1.4.5 Quiz Part 3: Creating a Phase Plane

## 1.4.5 Quiz Part 3: Creating a Phase Plane

Bookmark this page

You now found lines along which the population of marlin is constant and only the population of sardines is changing.

- Draw short segments perpendicular to the  $M$ -axis along these lines, to become arrows later.



[View Larger Image](#)

[Image Description](#)

**Equilibrium points** are points  $(S, M)$  where neither  $M(t)$  nor  $S(t)$  is changing, where  $\frac{dS}{dt} = 0$  and  $\frac{dM}{dt} = 0$ . Each such point represents an **equilibrium solution** of the system of differential equations: both populations are constant for all time.

### Question 5

2/2 points (graded)

There are two points where both  $\frac{dS}{dt} = 0$  and  $\frac{dM}{dt} = 0$ . One is  $(0, 0)$ . What is the other point?



X-Coordinate:

✓ Answer: 6.67

Y-Coordinate:

✓ Answer: 1.25

**Explanation**

The equilibrium points are  $(0, 0)$  and  $(\frac{20}{3}, \frac{5}{4})$ . Note that at  $(0, \frac{5}{4})$  we have  $\frac{dM}{dt} \neq 0$  and at  $(\frac{20}{3}, 0)$  we have  $\frac{dS}{dt} \neq 0$ , so these are not equilibrium points.

You have used 1 of 2 attempts

**i** Answers are displayed within the problem[Learn About Verified Certificates](#)

© All Rights Reserved



English ▼

© 2012–2017 edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open edX logos are registered trademarks or trademarks of edX Inc. | 粤ICP备17044299号-2

POWERED BY  
**OPENedX**