MITx CSE.0002x
Introduction to Computational Science and Engineering

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3.1.2 Finger Exercise: Rabbit and fox rates of change

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Finger Exercises 1 due Aug 3, 2023 05:00 IST   Completed

Problem: Calculate rates of change

2/2 points (graded)

> MO2.4

Consider the behavior of the rabbit and fox populations for the situation plotted in Figure 8.7. At $t = 0$, the number of rabbits and foxes are $r = 500$ and $f = 100$. What is the rate of change of the number of rabbits (i.e. $\mathbf{dr/dt}$) in units of $\mathbf{rabbits/month}$? Provide your answer with three digits of precision (of the form X.YZeP where P is the base10 power).

| 500 |

✔ Answer: 5.0000000000e+02

What is the rate of change of the number of foxes (i.e. $\mathbf{df/dt}$) in units of $\mathbf{foxes/month}$? Provide your answer with three digits of precision (of the form X.YZeP where P is the base10 power).

| -50 |

✔ Answer: -5.0000000000e+01

> Submit

ⓘ Answers are displayed within the problem

Problem: Calculate rates of change at another time

2/2 points (graded)

Now consider a later time, when the number of rabbits and foxes are $r = 500$ and $f = 350$ (e.g. this occurs at approximately 2.87 months) as shown in Figure 8.7. For this situation, what is the rate of change of the rabbits (i.e. $\mathbf{dr/dt}$) in units of $\mathbf{rabbits/month}$? Provide your answer with three digits of precision (of the form X.YZeP where P is the base10 power).

| -750 |

✔ Answer: -7.5000000000e+02

What is the rate of change of the foxes (i.e. $\mathbf{df/dt}$) in units of $\mathbf{foxes/month}$? Provide your answer with three digits of precision (of the form X.YZeP where P is the base10 power).

| -175 |

✔ Answer: -1.7500000000e+02

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ⓘ Answers are displayed within the problem

SOLUTION: The solution will be available shortly after the due date in Section 3.2.2.

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