2.2.4 Exploratory Quiz: Computing Average Value, Part II

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For this quiz, you'll want to use paper and pencil for computations.

Multiple Choice

1/1 point (graded)

Compute $\overline{M}$, the average value of the marlin population, using the second expression we found for $M(t)$:

$$\overline{M} = \frac{1}{L}\int_0^L \left(\frac{\mathbf{a}}{\mathbf{b}} - \frac{1}{\mathbf{b}}\frac{1}{S}\frac{dS}{dt}\right) dt.$$

Here are some hints:

- **Remember:** a and b are constants (for example, $\mathbf{a} = 0.5$ and $\mathbf{b} = 0.4$ in the example from the Part I of this section.)
- Integrate each term separately.
- The integral $\int_0^L \frac{1}{S}\frac{dS}{dt}dt$ can be simplified with a substitution $u = S(t)$.
- Keep in mind that L is the length of cycle. This means $S(L)$, the sardine population at time L, is equal to $S(0)$, the sardines' starting population.

- $\frac{1}{L}\frac{\mathbf{a}}{\mathbf{b}}$

- ◉ $\frac{a}{b}$ ✔
- ○ $\frac{1}{L}\frac{b}{a}$
- ○ $\frac{b}{a}$
- ○ None of the above.

Explanation

See the next video for the computation of this integral. The final solution is $\overline{M} = \frac{a}{b}$.

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Answers are displayed within the problem

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