

2023 AP Daily: Practice Sessions

AP Calculus AB

Session 2 – FRQ (Calculator Active)



An online bookseller receives orders at a rate of $B(t) = \sqrt{480t - 40t^2}$ in orders per hour since $t = 0$ after opening. The bookseller begins shipping orders at $t = 1$ hour after opening at a rate of $S(t) = 9 + 3^{0.035t^2}$ orders per hour. When the bookseller opens ($t = 0$ hours after opening) there are 57 orders in the system waiting to be shipped.

- Find $B'(2)$. Using correct units, interpret the meaning of your answer in the context of this problem.
- Find $\frac{1}{4} \int_1^5 S(t) dt$. Using correct units, interpret the meaning of your answer in the context of this problem.
- Write, but do not evaluate, an integral expression that gives the total number of orders waiting to be shipped at time $t = 3$ hours after the bookseller opens.
- Is the number of orders waiting to be shipped increasing or decreasing at $t = 10$ hours after the bookseller opens? Give a reason for your answer.