5. (12 points) At woot.com the staff has become quite good at predicting the number of items that will be sold based on the brand name, reliability reports, the price, and the predicted popularity of the item. The maximum number of items, N, that they expect to sell during the entire sale period on a given day is a function of what they call the Max Sales Index, i, so $N = f(i)$, where the units of i are referred to as "points."

(a) In the context of this problem, give a practical interpretation of $f(10)$.

The expression $f(10)$ represents the maximum number of items that woot.com expects to sell during the entire sale period on a given day when the Max Sales Index is 10 points.

(b) In the context of this problem, what is the practical interpretation of $f'(5) = 2500$?

The practical interpretation of $f'(5) = 2500$ is that woot.com expects a product with Max Sales Index of 6 will sell approximately 2500 more items than a product with Max Sales Index of 5.

(c) The number of Wooters (registered members of Woot.com) is currently over 500,000. Since there is not a mechanism for "un-registering," and the membership has grown very quickly, assume that the number of Wooters, W in thousands, is an invertible function of time, t, in hours, $W = g(t)$. In this context, give a practical interpretation of $(g^{-1})'(200) = .05$

$(g^{-1})'(200) = 0.05$ means that when the number of Wooters is 200,000, it takes approximately 0.05 hours (or three minutes) for the next 1000 Wooters to register.

(d) Sometimes woot.com sells bags of junk, "like shopping blindfolded at the Dollar Store." We can't say the exact name here, so we'll call them BoCs. Even these bags sell quickly on woot.com–typically in minutes. A recent BoC sale recorded the following data, where $s(t)$ gives the total number of BoC sales t minutes after the sale began. Use the data to estimate the $s'(10)$. Show your work.

time (minutes)	6	8	10	12	14	16	18
$s(t)$ (number of BoCs)	46	88	136	184	243	313	436

$$s'(10) \approx \frac{s(12) - s(8)}{12 - 8} = \frac{184 - 88}{4} = 24 \text{ BoCs per minute}$$