

MIT 18.01 Problem Set 5 Unofficial Solutions

Q1a) Suppose that at the beginning of day 0, some time last summer, the temperature in Boston was $y(0) = 65^\circ$ Fahrenheit and that over a 50-day period, the temperature increased according to the rule $y'(t) = y(t)/100$, with time t measured in days. Find the formula for y , and draw a graph of temperature on days 3 and 4, $3 \leq t \leq 5$, and label with the correct day and shade in the regions whose areas represent the average temperature each of the two days.^a

^aThe continuous average of a function is $\frac{1}{b-a} \int_a^b f(x)dx$. In this case $b-a=1$, so the average is the same as the integral. For more, see Notes, AV and Lecture 23.

t	$y(t)$
0	65
1	$65 + 65 / 100 = 65.65$
2	$65.65 + 65.65 / 100 = 66.3065$
3	$66.3065 + 66.3065 / 100 = 66.969565$
4	$66.969565 + 66.969565 / 100 = 67.63926065$
5	$67.63926065 + 67.63926065 / 100 = 68.3156532565$