PRINT your name:

The chemicals methyl bromide (CH_3Br) and sodium thiosulphate ($Na_2S_2O_3$) react to produce Br^- and $NaCH_3S_2O$. The total amount of sodium thiosulfate $S(t)$ at time t is well modeled by the logistic equation $S'(t) = rS(t)(S(t) - K)$. The constant r can be taken to be $-1/120$, and K depends on the relative concentration of the two chemicals. For the purposes of this question, let $K = 180$.

Since some of you may have memorized the solution to the logistic equation, I might as well tell you that $S(t) = \dfrac{K}{1 + CKe^{rKt}}$ for some constant C.

1. If the initial amount of sodium thiosulphate is 300 grams, what will be the amount after a long time?

2. If the initial amount of sodium thiosulphate is 30 grams, at what time t will there be 60 grams?
   Please leave your answer as an exact number. Do not approximate e, fractions, logarithms, π and so on.