

Problem statement A tissue culture grows until it has an area of 9 cm^2 . Let $A(t)$ be the area of the tissue at time t . One model for the growth rate is $A'(t) = k\sqrt{A(t)}(9 - A(t))$ for some constant k . This is reasonable because the number of cells on the edge is proportional to $\sqrt{A(t)}$ and most of the growth occurs on the edge.

- a) Without solving the equation, show that the maximum rate of growth occurs at any time when $A(t) = 3 \text{ cm}^2$.
- b) Assume that $k = 6$. Find the solution corresponding to $A(0) = 1$ and sketch its graph.
- c) Do the same for $A(0) = 4$.