

## Problem 28

Consider the initial value problem

$$y' = ty(4 - y)/(1 + t), \quad y(0) = y_0 > 0.$$

- (a) Determine how the solution behaves as  $t \rightarrow \infty$ .
- (b) If  $y_0 = 2$ , find the time  $T$  at which the solution first reaches the value 3.99.
- (c) Find the range of initial values for which the solution lies in the interval  $3.99 < y < 4.01$  by the time  $t = 2$ .