

**Problem 23**

- (a) Show that  $\phi(t) = e^{2t}$  is a solution of  $y' - 2y = 0$  and that  $y = c\phi(t)$  is also a solution of this equation for any value of the constant  $c$ .
- (b) Show that  $\phi(t) = 1/t$  is a solution of  $y' + y^2 = 0$  for  $t > 0$  but that  $y = c\phi(t)$  is not a solution of this equation unless  $c = 0$  or  $c = 1$ . Note that the equation of part (b) is nonlinear, while that of part (a) is linear.