

1. Solve the separable equations:

a.  $\frac{dy}{dx} = 2xy$

b.  $1 + e^{3t} \frac{dy}{dt} = 0$

c.  $\frac{dy}{dx} + y^2 \sin x = 0$

d.  $t \frac{dy}{dt} = 4y$

2. Solve the linear equation by finding an integrating factor:  $y' + 2y = te^{-2t}$ .