

**LINEAR FIRST-ORDER EQUATIONS- examples solved in class**

1.  $y' = 2y + e^{-t}$
2.  $y' = -2y + 3 + \sin t$
3.  $y' = (-2 + \sin t)y$
4.  $y' = (-2 + \sin t)y + e^{2t} \sin t$
5.  $y' = (1 - 2t)y + te^t$
6.  $y' = (\sin t)y + \sin t$
7.  $ty' + y = t^3$
8.  $(1 + t^2)y' + 4ty = t, \quad y(1) = 1/4$
9.  $(\sin t)y' + (\cos t)y = t \sin t, \quad y(\pi/2) = 2$
10.  $y' + p(t)y = t, \quad y(0) = 1; p(t) = 1 \text{ if } t < 2, p(t) = 3 \text{ if } t > 2$   
(continuous solution).