Math 1B Discussion Problems 16 Apr

1. Solve the following differential equations.
   (a) $y' + 2y = e^{-x}$
   (b) $xy' + 2y = 1 - \frac{1}{x}, x > 0$
   (c) $(1 + x)y' + y = \sqrt{x}$
   (d) $(\tan x)y' + y = \sin^2 x, 0 < x < \frac{\pi}{2}$
2. Solve the following initial value problems.
   (a) $y' + 2y = 3, y(0) = 1$
   (b) $xy' + 2y = x^3, x > 0, y(2) = 1$
   (c) $(x + 1)y' - 2(x^2 + x)y = \frac{e^{x^2}}{x+1}, x > -1, y(0) = 5$