Ordinary Differential Equations - 10413181

Homework No. 2

1. Solve

   (a) $y' + \tan(x)y = x\sin(2x)$.

   (b) $y' - 3x^2y = -x^2, \quad y(0) = 1$.

2. Solve $y' + \left(\dfrac{\ln^2 x}{\sin^2 x}\right) y = 0, \quad y(5) = 0$.

3. Solve

   (a) $y' + y^2 \sin x = 0.$

   (b) $y' = 2(1+x)(1+y^2), \quad y(0) = 0.$

4. Substitute $v = y/x$ in the following equations, and solve. Remember to write your solution in terms of y. (*Hint:* $v = y/x \Rightarrow y' = v'x + v$.)

   (a) $y' = \dfrac{x+2y}{x}$,

   (b) $y' = \dfrac{x^2+xy+y^2}{x^2}$