

## First Order Linear Differential Equations- HW Problems

In problems 1 and 2 find the general solution to the differential equations.

1.  $(x^2 + 1) \frac{dy}{dx} + 2xy - 3x = 0$

2.  $xy' + y = 4\sqrt{x}; \quad x > 0.$

In problems 3-7 solve the initial value problems.

3.  $\frac{dy}{dx} = -2xy + 2xe^{(-x^2)}; \quad y(0) = 2$

4.  $xy' = 2y + x^3 \sin(x); \quad y(1) = 0$

5.  $(x^2 + 1)y' + 5xy = x; \quad y(0) = 2$

6.  $xy' + 4y = \frac{e^{-x}}{x^3}; \quad y(1) = 0, \quad x > 0$

7.  $(1 + x)y' + y = \cos(x); \quad y(0) = 1, \quad 1 + x > 0.$