EE206 Assignment 2 *

Due Oct. 14th Sept.

1. Solve the following linear first-order differential equations
   a. $y' + 3x^2y = x^2$; by using variation of parameters
   b. $\cos^2(x)sin(x)\dfrac{dy}{dx} + \cos^3(x)y = \sin(x)$, by using integrating factor
2. Solve the given Bernoulli equations by using an appropriate substitution.
   a. $\dfrac{dy}{dx} = y(xy^4 - 1)$
   b. $y' + \dfrac{y}{x} - \sqrt{y} = 0$ with initial condition $y(4) = 1/9$.
3. Solve the following differential equations.
   a. $\dfrac{dy}{dx} = \tan^2(x + y)$
   b. $\dfrac{dy}{dx} = (x + y + 1)^2$
4. State the type of differential equation, or type of technique required to solve the following differential equations. *eg: separation of variables, linear first-order, substitution (Bernoulli, reduction to separation of variables)*
   a. $y^2\dfrac{dy}{dx} = x$
   b. $\dfrac{dy}{dx} = \sin(x + y)$
   c. $x\dfrac{dy}{dx} - y = x^2\sin(x)$
   d. $x\dfrac{dy}{dx} - (1 + x)y = xy^2$

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