

**Spring 2018-2019**  
**Math 342**  
*Applied Mathematics*

**Apr 22**

Solve the given Volterra integro-differential equation by *the series solution method*.

1.  $y'(x) = 1 - 2x \sin x + \int_0^x y(t) dt; y(0) = 0.$

2.  $y'(x) = -1 + \frac{x^2}{2} - xe^x - \int_0^x ty(t) dt; y(0) = 0.$

3.  $y''(x) = 1 - x(\cos x + \sin x) - \int_0^x ty(t) dt; y(0) = -1, y'(0) = 1.$

4.  $y''(x) = -8 - \frac{1}{3}(x^3 - x^4) + \int_0^x (x - t)y(t) dt; y(0) = 0, y'(0) = 2.$

5.  $y''(x) = \frac{x^2}{2} - x \cosh x - \int_0^x ty(t) dt; y(0) = 1, y'(0) = -1.$