

ASSIGNMENT 2:

1. Find the solution to the IVP;

$$y'' + 8y' - 9y = 0$$

$$y(1) = 2$$

$$y'(1) = 0$$

2. Find the most general solution to:

$$(a) \quad y'' - 2y' + 5y = 25x^2 + 12$$

$$(b) \quad y'' + y = 2 \cos x$$

$$(c) \quad y'' - 2y' = 12x - 10$$

3. Find the solution to the IVP;

$$y'' - 3y' + 2y = 14 \sin 2x - 18 \cos x$$

$$y(0) = 1$$

$$y'(0) = 0$$

4. Find the general solution of

$$y'' + y = \tan x.$$

5. Given the equ.

$$(1+x^2)y'' + 2xy' - 2y = 0 :$$

(a) Explain why you can look for a power series solution of the type $y(x) = \sum_{n=0}^{\infty} a_n x^n$.

(b) Find the general solution to this DE using power series.

(c) What can you say about the radius of convergence of this power series?

~~Find~~ Find the solution to the DE satisfying

$$y(0) = 2$$

$$y'(0) = 1.$$

6. Solve $y'' + (\sin x)y = 0$ & find the general solution using power series.

7. Given the DE

$$4x y'' + 2y' + y = 0$$

find a single solution to this DE valid in an open interval containing $x = 0$.