Worksheet #8
Date : 19/03/2024 **Name:** _____
MTH204: ODEs/PDEs
Semester: Winter 2024 **Section:** _____

Problem 1. Solve the ODE

$$y'' - y' - x^2 y = 0$$

using the power series method.

Problem 2. Find a solution of

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

by reduction to a Legendre equation.

Problem 3. Solve

$$xy'' + y' + \frac{1}{4}y = 0$$

by making the change of variable $z = \sqrt{x}$.

Problem 4. Solve

$$x^2 y'' + \frac{1}{4}\left(x + \frac{3}{4}\right)y = 0$$

by making the change of variable $y = u\sqrt{x}$, $z = \sqrt{x}$.

Problem 5. Solve

$$x^2 y'' + xy' + (x^2 - 16)y = 0$$