

Quiz 3    Math 202    Semester: 163    Duration: 40 minutes

Full Name:

ID:

**Q 1** Find the general solution of

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

Noting that  $y_1 = x$  and  $y_2 = x^2 + 1$  are two linearly independent solutions of the associated homogeneous DE.

**Q 2** Solve  $x^3y''' - xy' + 5y = 0$ .

**Q 3** Given the DE:  $(x^2 - 2x + 5)y'' + xy' - y = 0$ . Find the region of validity of the power series (Do not solve the DE) solution around  $x = -1$ .

**Q 4** Use power series centered at 0 to solve  $y'' + xy' - 2y = 0$ .