REQUIRED:

1. **1-D Change of Variables**

   Consider the differential equation:

   $$x^2 \left(\frac{d^2 y}{dx^2} \right) + 2x \left(\frac{dy}{dx} \right) - 5y = 0$$

   Make the change of variable $x = e^z$ to find a differential equation with constant coefficients.

2. **1-D Change of Variables**

   Consider the differential equation:

   $$x^2 \left(\frac{d^2 y}{dx^2} \right) + x \left(\frac{dy}{dx} \right) - (1 - x) \, y = 0$$

   Make the change of variable $u = 2\sqrt{x}$ to find a new form of the differential equation.