What now?

- Predict material functions with the Generalized Newtonian Constitutive Equation.
  
  \textit{Example: Elongational viscosity, etc.}

- Calculate velocity and stress fields predicted by Generalized Newtonian Constitutive Equations

  \textit{Example: Poiseuille flow, drag flow, etc.}

\begin{example}
Pressure-driven flow of a Power-Law Generalized Newtonian fluid in a tube

- steady state
- well developed
- long tube
\end{example}
Velocity field
Poiseuille flow of a power-law fluid:

\[ v_z(r) = \left( \frac{R(L\rho g + P_o - P_L)}{2Ln} \right)^\frac{1}{n} \left( \frac{R}{1+1} \right) \left( 1 - \left( \frac{r}{R} \right)^\frac{1}{n+1} \right) \]

Solution to Poiseuille flow in a tube
incompressible, power-law fluid
Solution to Poiseuille flow in a tube
incompressible, power-law fluid

EXAMPLE: Drag flow of a Power-Law GNF between infinite parallel plates

- steady state
- incompressible fluid
- infinitely wide, long
**EXAMPLE:** Pressure-driven flow of a Power-Law GNF between infinite parallel plates

- steady state
- incompressible fluid
- infinitely wide, long

\[ W \]

\[ x_1 = 0 \]
\[ p = P_o \]

\[ x_1 = L \]
\[ p = P_L \]