Problem 2A.3

Volume flow rate through an annulus. A horizontal annulus, 27 ft in length, has an inner radius of 0.495 in. and an outer radius of 1.1 in. A 60% aqueous solution of sucrose (C$_{12}$H$_{22}$O$_{11}$) is to be pumped through the annulus at 20°C. At this temperature the solution density is 80.3 lb$_m$/ft$^3$ and the viscosity is 136.8 lb$_m$/ft · hr. What is the volume flow rate when the impressed pressure difference is 5.39 psi?

Answer: 0.110 ft$^3$/s