

$$d_h = \frac{2 * x * y}{x + y}$$

$$v_{rect} = \frac{q}{x * y}$$

$$v_{circ} = \frac{q * 4}{pi * d^2}$$

$$Pd_{rect} = \left(\frac{1}{-1.8 * \log_{10} \left(\frac{6.9 * vis}{v * d_h} + \left(\frac{k}{3.71 * d_h} \right)^{1.11} \right)} \right)^2 * \frac{0.5 * rho * v^2}{d_h}$$

$$Pd_{circ} = \left(\frac{1}{-1.8 * \log_{10} \left(\frac{6.9 * vis}{v * d_h} + \left(\frac{k}{3.71 * d} \right)^{1.11} \right)} \right)^2 * \frac{0.5 * rho * v^2}{d}$$