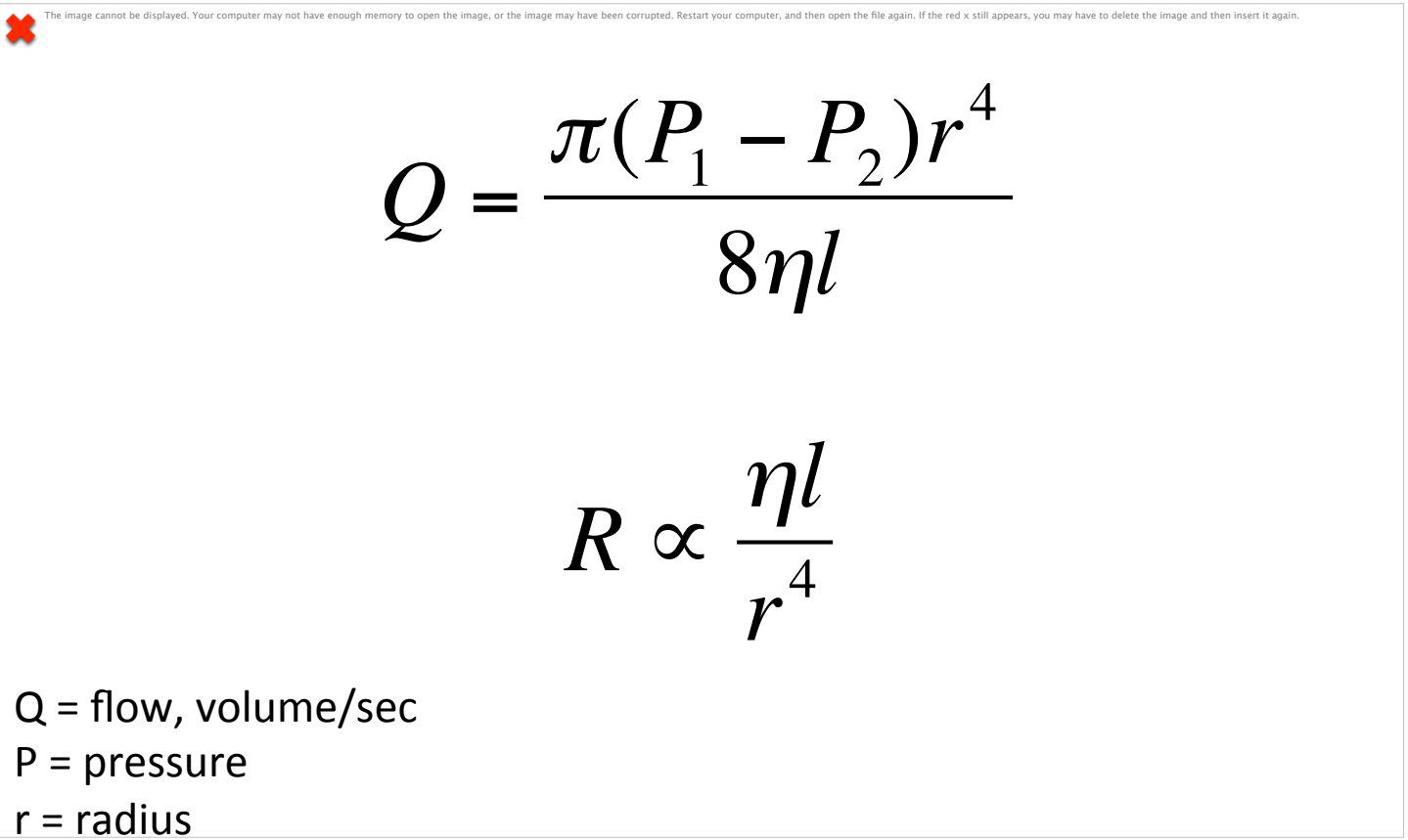
Bernoulli's Equation

$$\frac{p_1}{\rho} + \frac{v_1^2}{2} + gz_1 = \frac{p_2}{\rho} + \frac{v_2^2}{2} + gz_2 = \alpha$$

$$p_1 + \frac{\rho v_1^2}{2} + \rho g z_1 = p_2 + \frac{\rho v_2^2}{2} + \rho g z_2 = \beta$$

p = fluid pressure
ρ = fluid density
v = fluid velocity
g = acc'l of gravity
z = height above reference plane

Poiseuille's Equation



$$Q = \frac{\pi(P_1 - P_2)r^4}{8\eta l}$$

$$R \propto \frac{\eta l}{r^4}$$

Q = flow, volume/sec
P = pressure
r = radius
l = length
η = dynamic (shear) viscosity
R = resistance

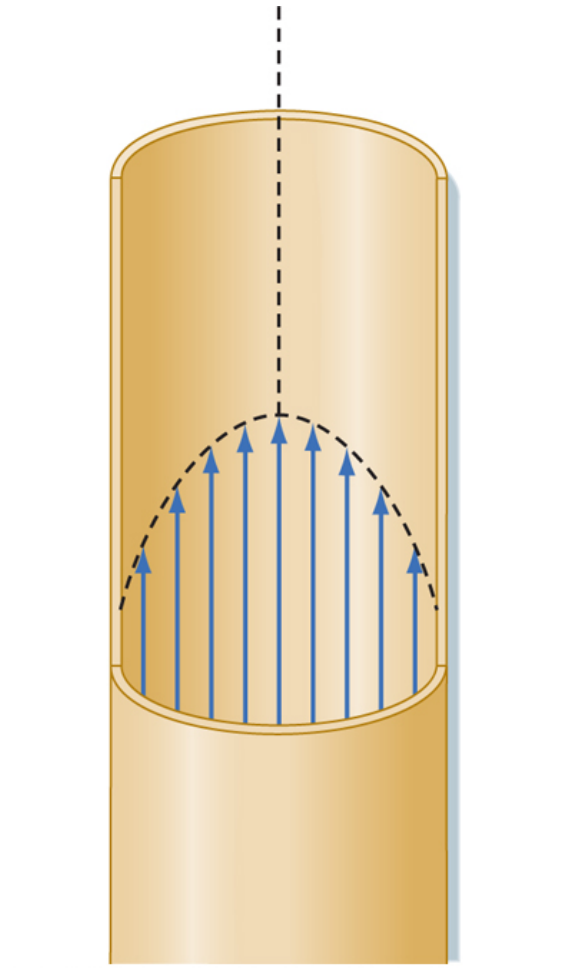
Fluid Resistance

$$R_t = \sum_1^n R_i$$

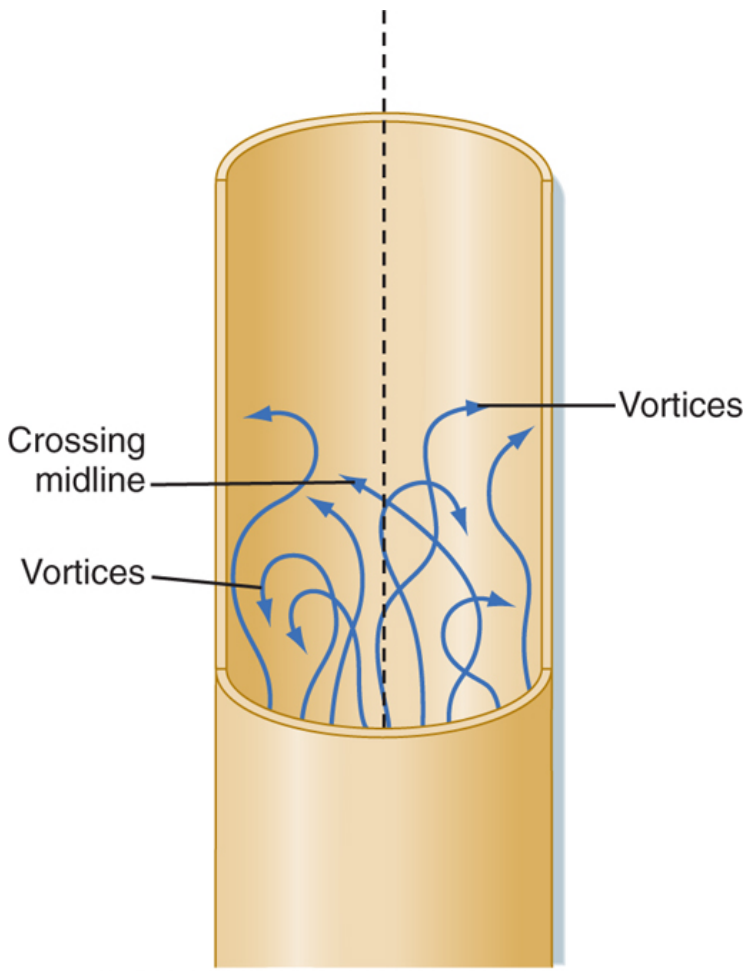
Flow paths in series

$$\frac{1}{R_t} = \sum_1^n \frac{1}{R_i}$$

Flow paths in parallel



Re < 2000



Re > 2000

END

Video 2, Module 8