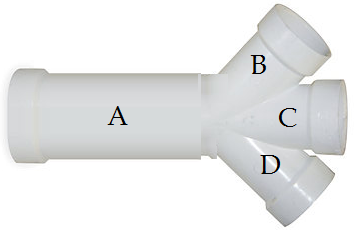
Worksheet - Fluids in motion

**1.** The water flowing through pipe A flows out through pipes B, C, and D. The diameter of a cross section of pipe A is 2cm, and all of other pipes have a diameter of 1.4cm. The volume flow rate in pipes B, C, and D are 28L/min, 18L/min, and 10L/min respectively.



**a)** What is the volume flow rate of pipe A?

**b)** What is the pipe A to pipe B ratio of the speed of water?

**2.** A liquid of density 820 kg/m3 flows through a horizontal pipe that has a cross sectional area of 2.8x10-2 m2 in region A and a cross sectional area of 8.1x10-2 m2 in region B. The pressure difference between the two regions is 6.1x103 Pa.

**a)** What is the volume flow rate? Since it's horizontal the potential terms cancel out.

We need to combine the continuity equation with Bernoulli's principal.

We'll do this by solving both volume flow rate equations for velocity and insert them into the Bernoulli equation.

and so

Next we solve for our objective, which is the volume flow rate represented as R in the equations.

**b)** What is the mass flow rate?