PROBLEM: **A pipe bend carries discharge of 0.10 m^3/s, is kept in vertical plane such that the outlet section is 1.0 m above than inlet section which is at ground level. The diameters at inlet and outlet sections of bend are 20 cm and 10 cm respectively. The pressure at section 1 is 100 KPa. The section 2 is inside the bend. The head lost from section 1 to section 2 is 5.0 of the difference of velocity heads between two sections. The bend is oriented at 135° from the positive X-direction (or 45° with negative X-direction).**

Find the following:

(1) Total head lost in terms of m of water (1.5)
(2) Total energy at section 1 in m (2.5)
(3) Total energy at section 2 in m (2.5)
(4) Direction of flow (1.0)
(5) Component of hydrodynamic force F_x (5.0)
(6) Component of hydrodynamic force F_y (5.0)
(7) Power required to move the bend in positive X-direction with velocity of 5.0 m/s (2.5)