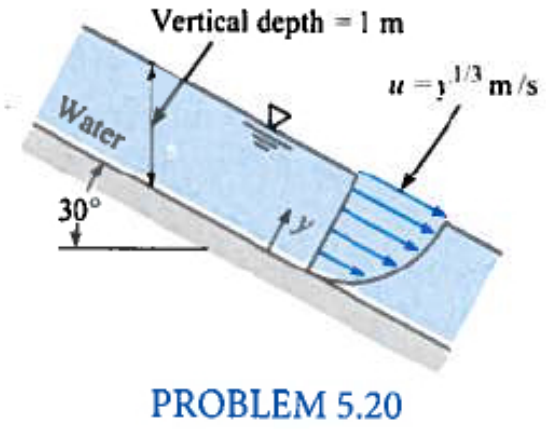
CE 3305 Engineering Fluid Mechanics
Exercise Set 10
Summer 2018 – GERMANY

1. (Problem 5.9 pg 196) A pipe with a 2 m diameter carries water with mean section velocity of 4 m/s. What is the volumetric discharge in cubic meters per second?

2. (Problem 5.20 pg 197) Figure 1 is a schematic of flow in a rectangular channel that is 1.2 m wide. The velocity distribution measured perpendicular from the channel bottom is shown on the figure. Estimate the discharge in the channel.



PROBLEM 5.20

Figure 1: Velocity distribution in a rectangular channel.

(Problem 5.20 pg 197) (Continued)

3. (Problem 5.23 pg 197) Water enters the lock of a ship canal through 180 ports, each port having a 2 ft (0.6 m) by 2 ft (0.6 m) cross section. The lock is 900 ft (274.4 m) long and 105 ft (32.01 m) wide. The lock is designed so that the water surface in it will rise at a maximum rate of 6 ft/min (1.83 m/min). For this condition, what is the mean section velocity in each port?