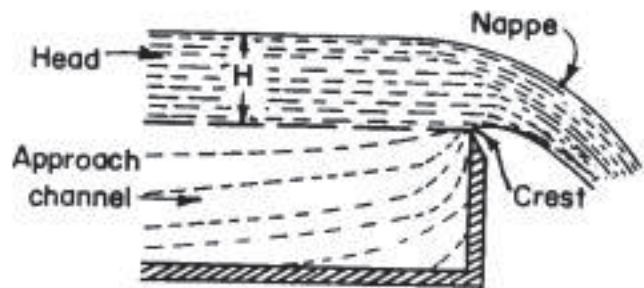


Exercise set 1

1 Experimental Weir equation

Use the Π theorem and the following experimental table to find the relation between the flow rate Q and the crest height H for a Weir of width $L = 1$ m.

H [10^{-2} m]	Q [10^{-3} m ³ /s]
2	5.26
4	14.88
6	27.34
8	42.12
10	58.83
12	77.33
14	97.45
16	119.06
18	142.07
20	166.40



Hint: Assume the functional dependence $Q(H, g, L)$. Head losses due to dissipation will be included in a phenomenological coefficient.

2 "Ideal" Weir equation

Using the Bernoulli equation derive the Weir equation under the following simplifying assumptions:

- the pressure throughout the nappe is atmospheric
- head losses and surface tension can be neglected
- the streamline above crest is horizontal

Compare this result with the experimental law derived in Problem 1.