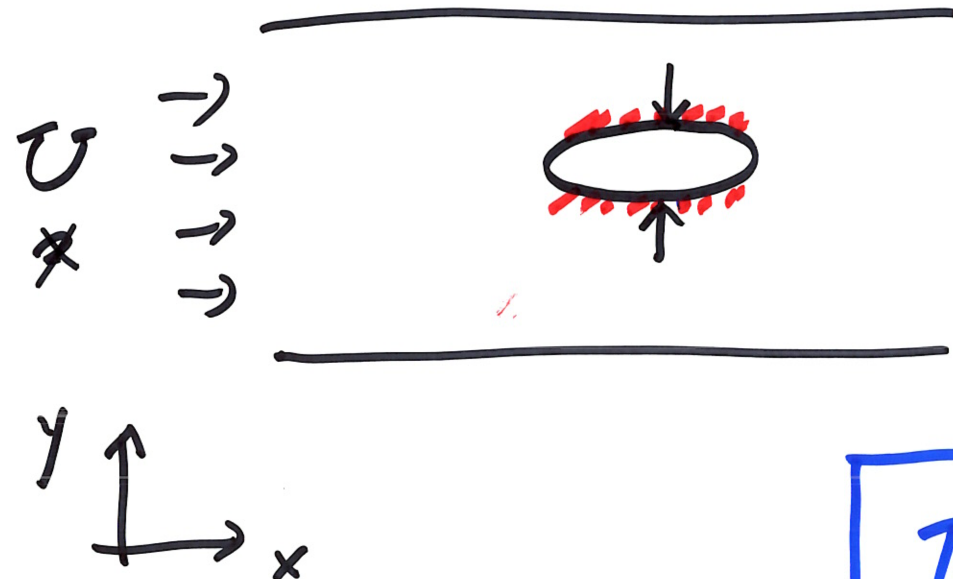
Lecture 27

12/2

Proj 3 sol.

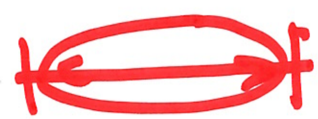
Task 1



F_L

* **Lift force**

relevant x-section



$Re \sim$

Task 4

Lift coefficient $C_L = \dfrac{F_L}{\frac{1}{2}\rho U^2 \underset{\sim}{A}}$

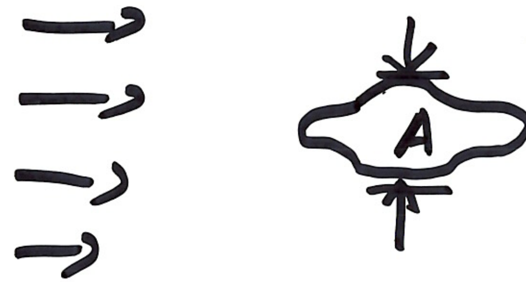
Task 2

Lift

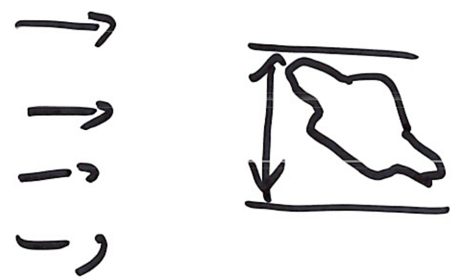
$\theta = 0°$

$\theta = 32°$

Drag Force

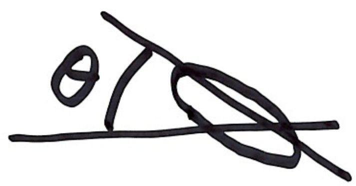


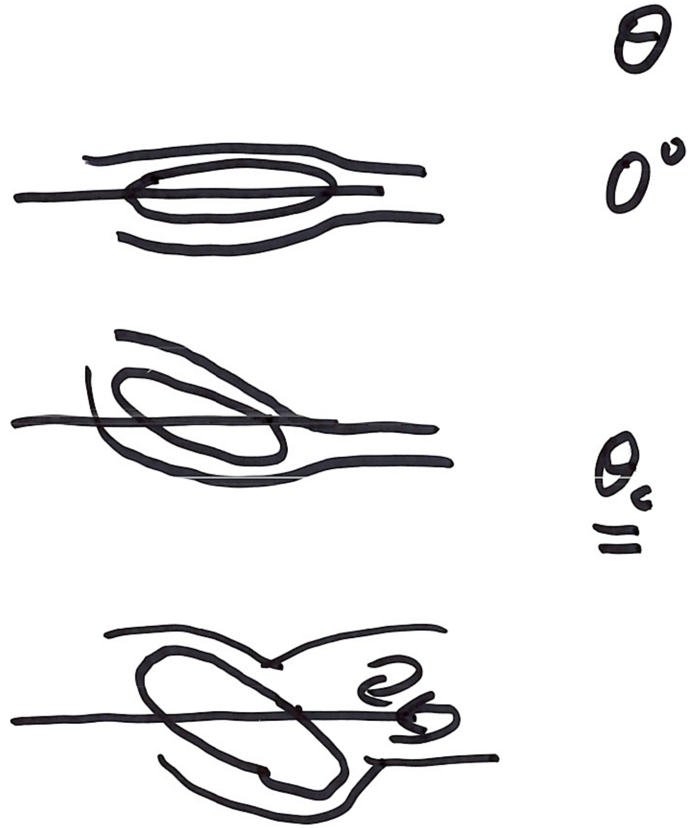
$\theta = 0°$

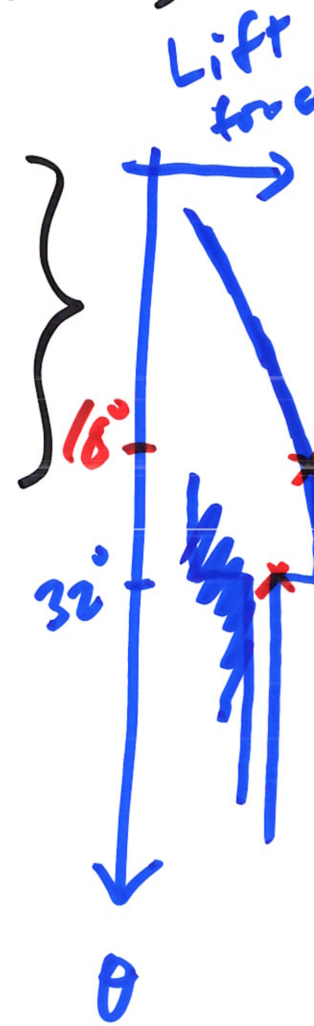


$\theta = 32°$

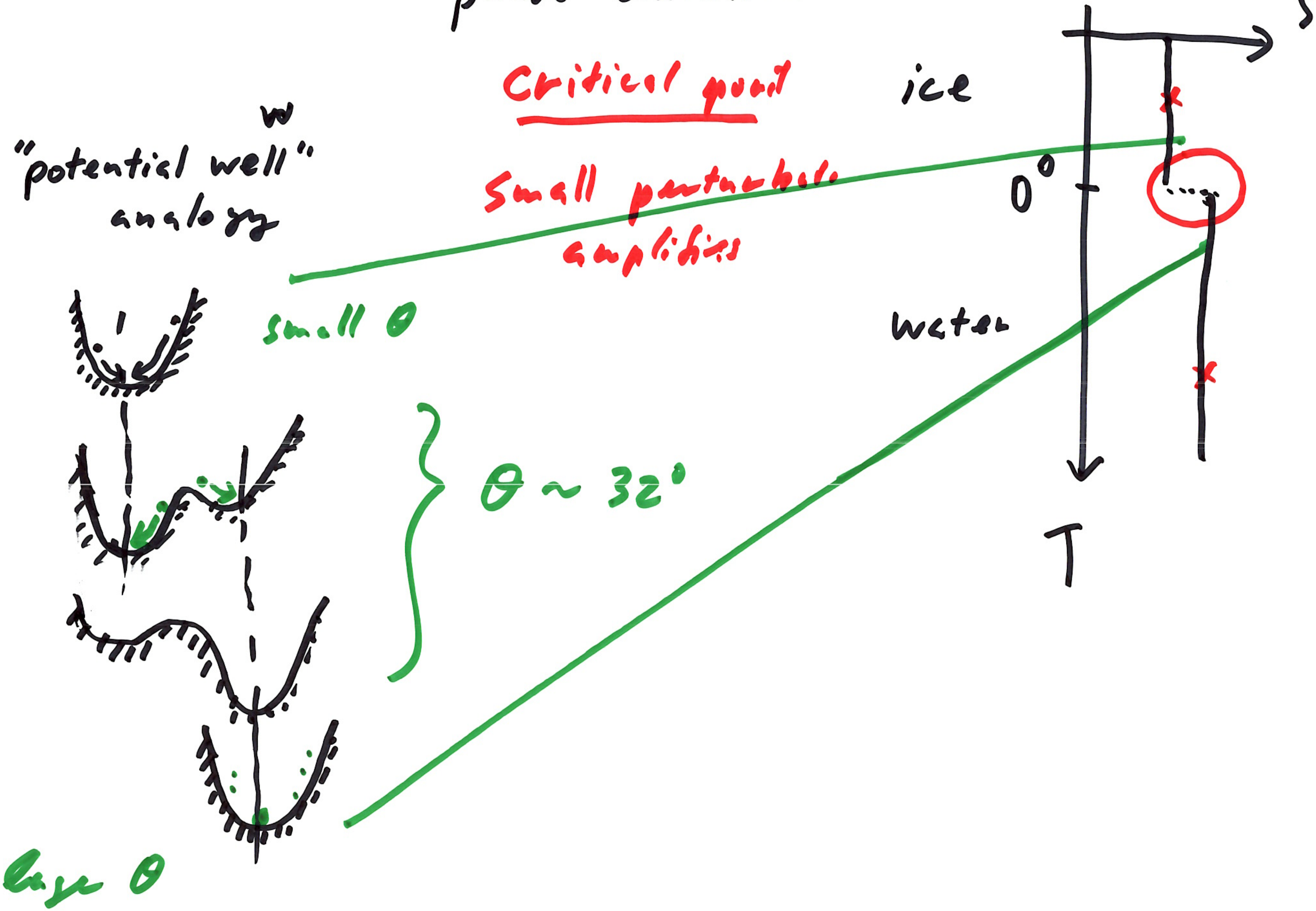
Critical point
of
transition
(from 1 flow regime to another)



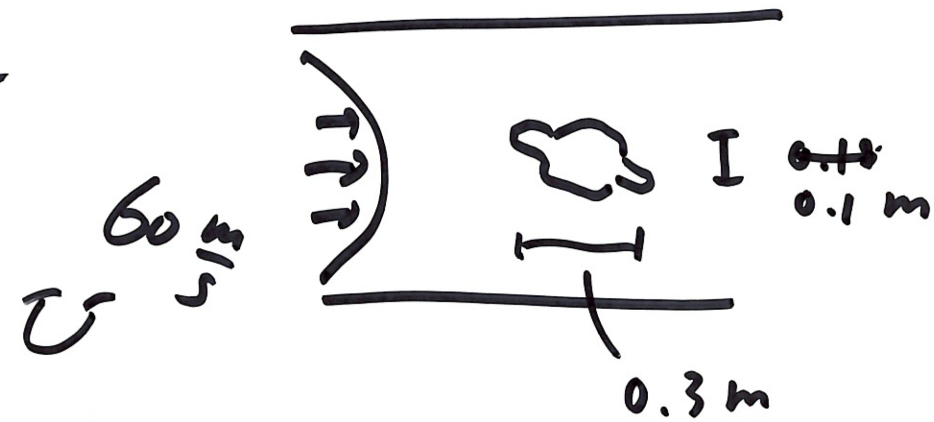




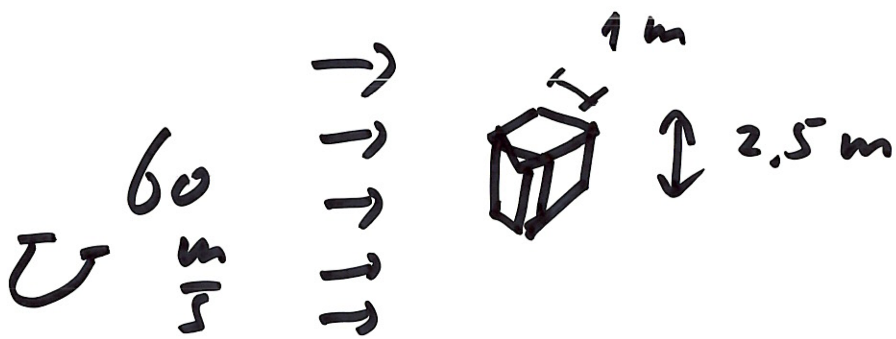
phase transition



Task 2



Task 3



Final Exam Thu., Dec 9, 12:10 - 2:00 pm

10 %

multiple choice

closed book — Calculator OK

only correct combo gets credit

Comprehensive

Projects

1. { * Governing eqs. ← how we ~~set~~ Fluent
   * Models ~~laminar~~ }

1-phase vs multiphase

p-based

ρ-based

laminar vs turbulent (k-ε)

Re

vs

flow w/ heat ~~transfer~~

flow w/o thermal

compressible

Mach #

(2) physical parameters → ρ → const

ρ → Boussinesq

ρ → fully varying, ideal gas

physical parameters → multi-phase

c_1, c_2, c_3

VF

boundary conditions

$\vec{\vec{\ }}$ velocity inlet

pressure inlet

wall

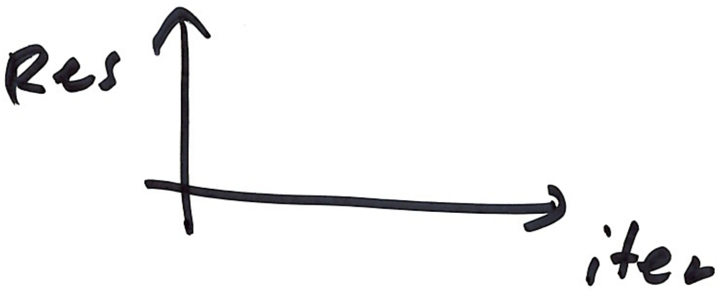
$\vec{\ }$ p - outlet

outflow

1-phase

multi-phase

③ numerical ~~sf~~ schemes. mesh etc.



steady sol.

transient ″

VOF

explicit vs. implicit

Δt Δx

accuracy

numerical stability ✓

④ Misc.

post-processing

- compute <u>lift</u> ✓ / <u>drag</u> ✓
- energy balance
  - e.g. Task 3
  - HW 1

ALL Qs come from the Lectures + projects + HW 1