

Exam 2 Review

- 2 Hour Time Limit
- Testing Center
- Tuesday - Thursday
- Open book
- Open notes

ChE 436 Competencies for Exam 2

Level 3

- none

Level 2

- Students will learn about chemical processes, units, and corresponding equipment related to process control
- Students will be able to set up and solve simple transient material balances.
- Students will be able to set up and solve simple transient energy balances.
- Students will understand the concept of a transfer function in classical control and be able to use transfer functions (Laplace domain)

So What Will Be On The
Exam?

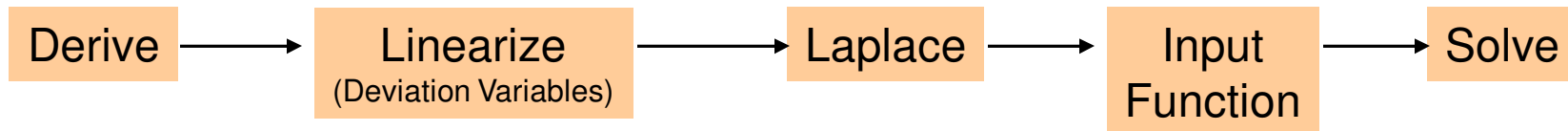
ChE 436 Competencies for Exam 2

Level 3

- none

Level 2

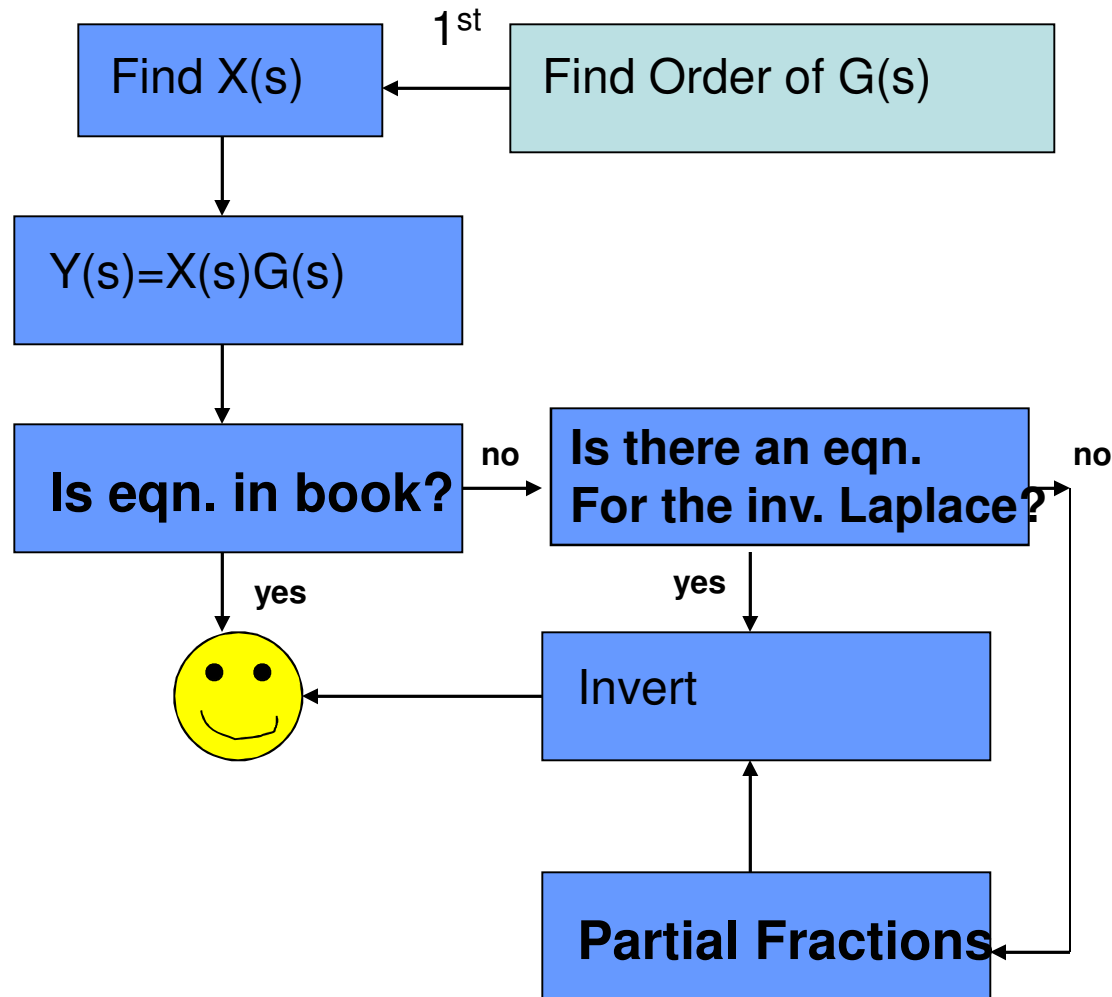
- Students will learn about chemical processes, units, and corresponding equipment related to process control
- Students will be able to set up and solve simple **transient material balances**.
- Students will be able to set up and solve simple **transient energy balances**.
- Students will understand the concept of a **transfer function** in classical control and be able to use transfer functions (**Laplace domain**)



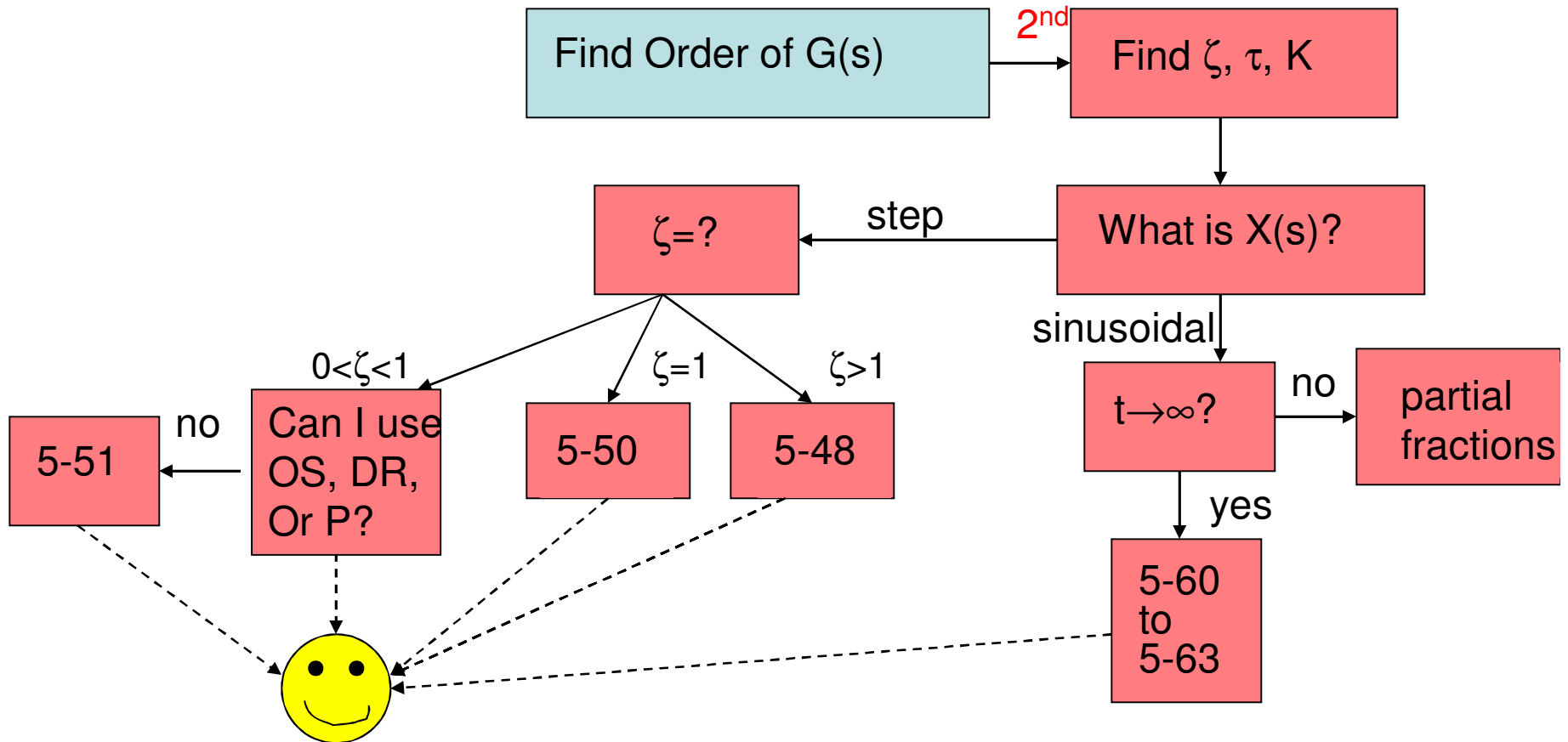
Solving Transfer Functions

Find Order of $G(s)$

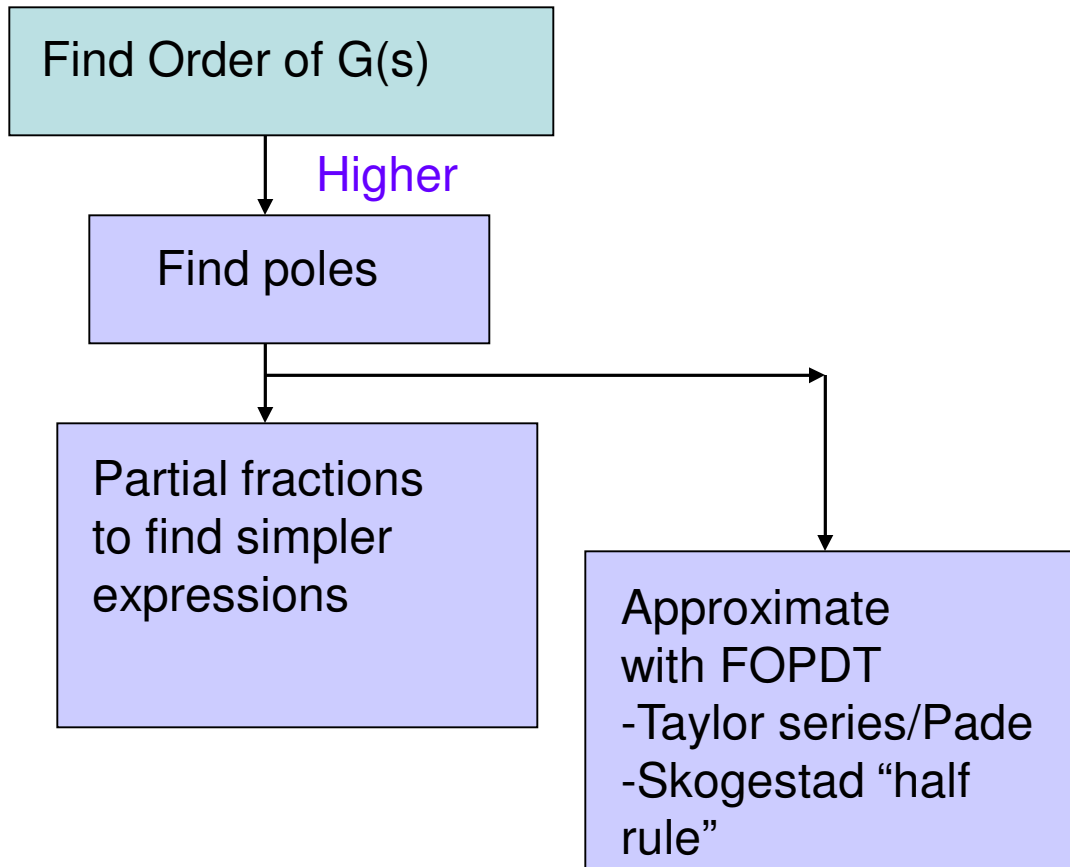
Solving Transfer Functions



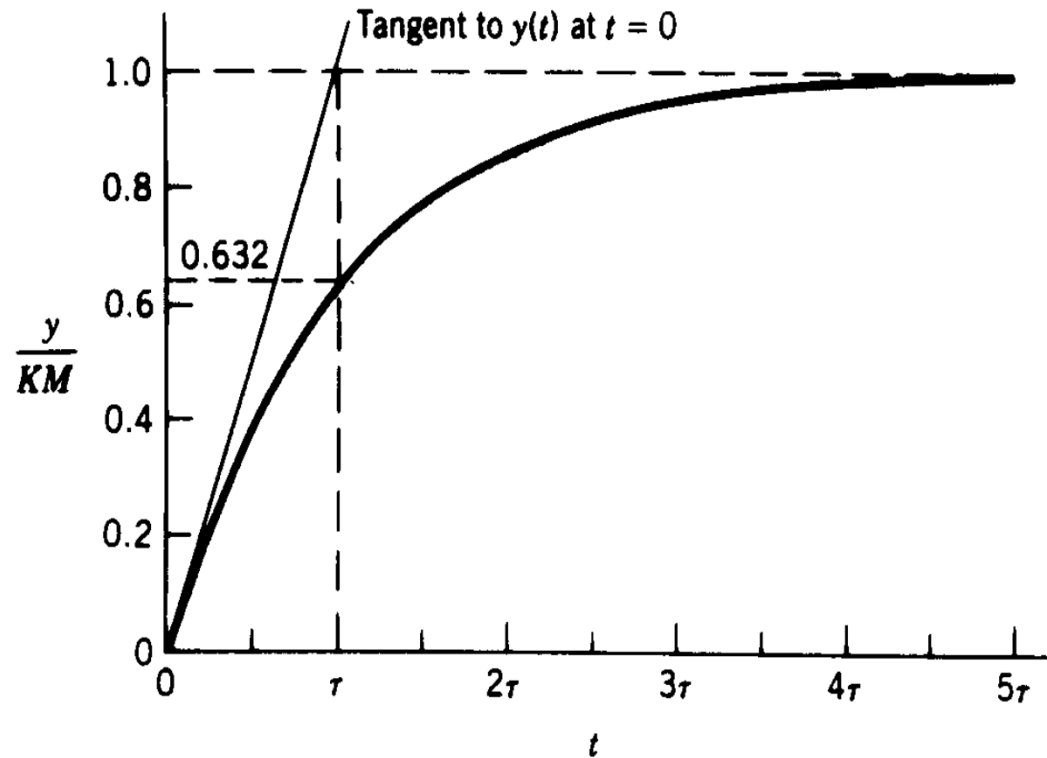
Solving Transfer Functions



Solving Transfer Functions

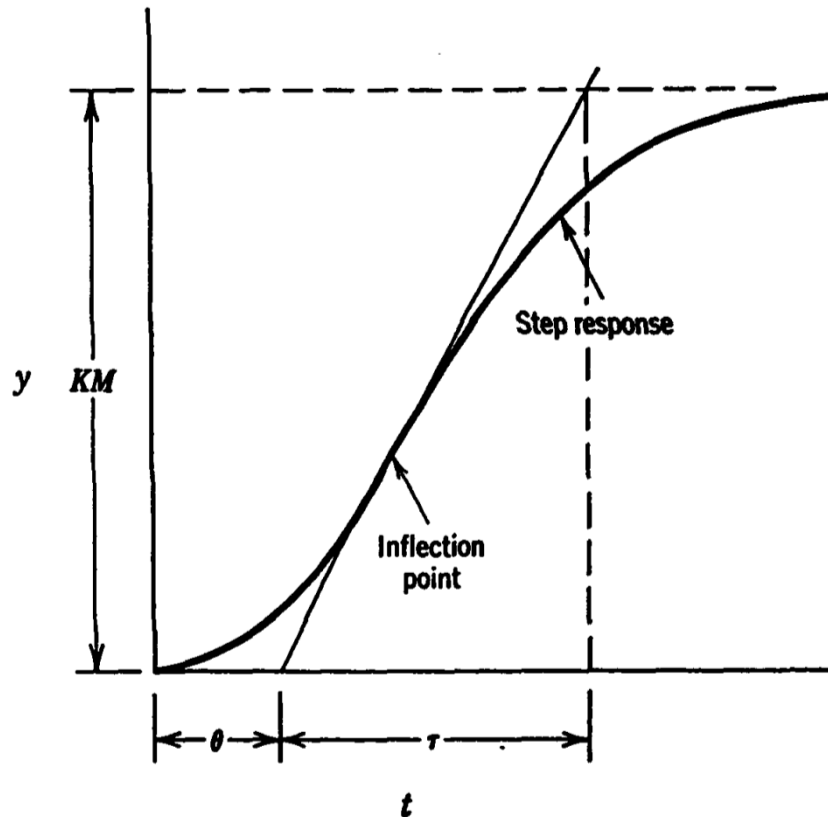


Graphical Method for First Order Systems



- FOPDT
- 0.632 rule for τ

Graphical Method for Second Order Systems



- Draw tangent through inflection point
- Intersection at bottom = θ
- Intersection at top = $\theta + \tau$