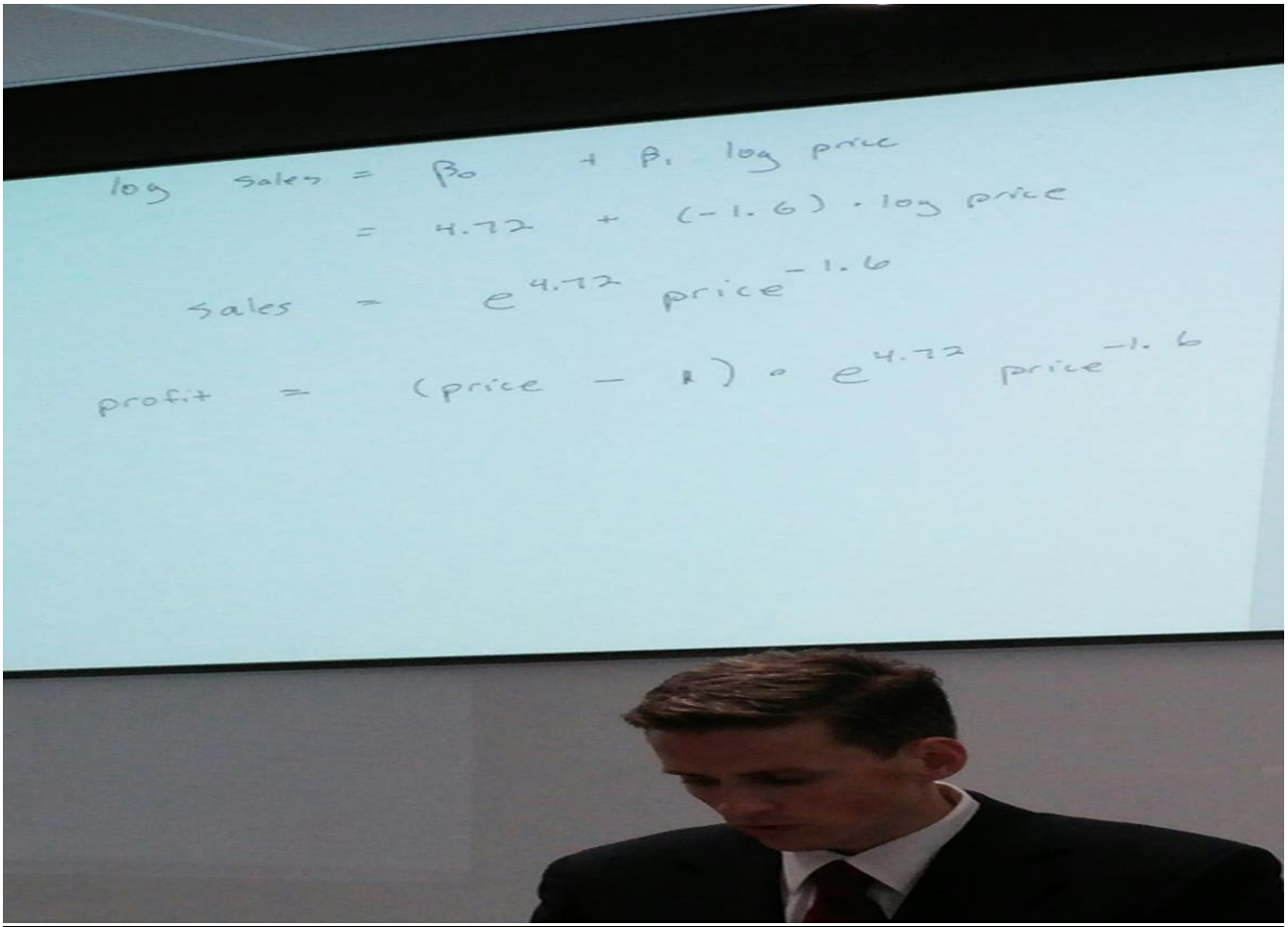
2/9/2015 Notes (by Erik Margetis)

Milk Case study

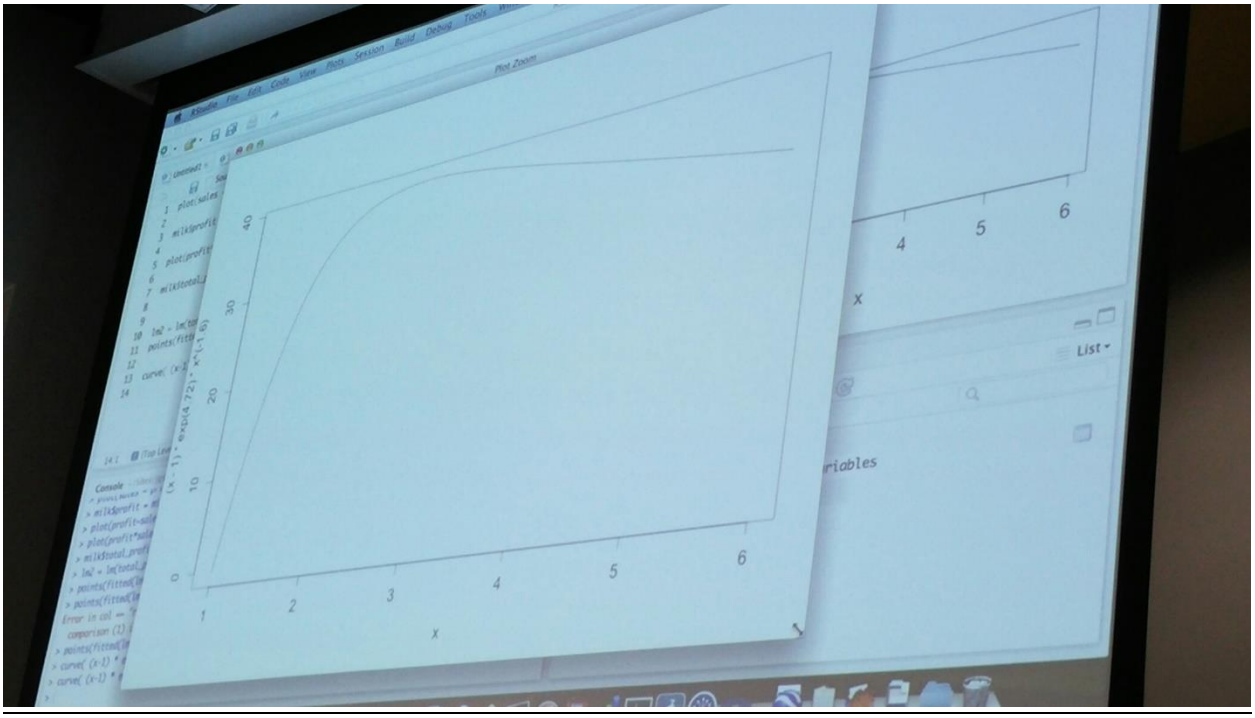
- Guiding principles of top down decision:
  - Goal is to maximize PROFIT
  - What do we control to achieve goal? Price per gallon
  - Profit = Revenue – Expenses
    - = (Revenue per unit – expenses per unit)* Units sold
    - = (price/unit – expenses/unit)*Units sold
      - Make assumption about expenses per unit
    - = [Price/Unit – Expense/Unit] * f(price)
  - cost at $1.29
    - = [x – 1.29]
  - Then combine data sets (Adding a column) to original and [x-1.29]

OR

- Plot logarithmic function



2. Find Maximum



<u>Recap</u>

Used historical data to fit relationship

OR

Used linear on a log scale

Profit = (price – 1) * e^4.72 * price ^-1.6

Top down/bottom up should be used to get past road blocks

- Top down = from first principles, what would I need to know (start with solution and work backwards)
- Bottom up = start with data then work forwards

Video game walkthrough

- Care about reaction time
- Variables are littered and FarAway, both are dummy variables
- Use "+" in R to denote "and" for using two variables

- Yhat = beta0 + beta1 * littered + beta2 * Faraway
    - Yhat(not literered, not faraway)
        - =beta0
    - Yhat(littered, not faraway)
        - =Beta0 + beta1
    - Yhat(not littered, far away)
        - =Beta0 + beta2
    - Yhat(littered, faraway)
        - =Beta0 + beta1 + beta2
- Interaction model (When dummy variables interact with each other)
- Yhat = beta0 + beta1 * littered + beta2 * Faraway + beta3 * littered * faraway
    - Yhat(littered,faraway)
        - Only one that changes
        - Yhat = beta0 + bet1 + beta2 + beta3