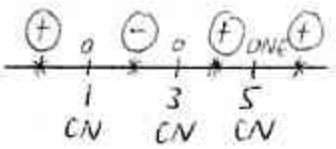
CH. 3 - REVIEW OUTLINE

(3.1, 3.2) Graphing Using f', f''

① Find domain of f

② Find f', CNs
in ①
where f' = 0 or DNE

③ Sign Diagram for f'
Classify Pts. at CNs

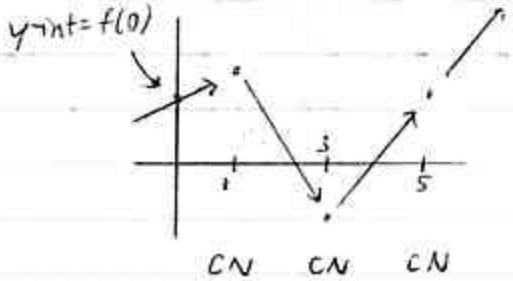
Ex f' 

(use factored form)

f ↗ ↘ ↗ ↗
1st DT ⇒ R. Max Pt. | R. Min Pt. | Neither

Plug into f to get y-coords.

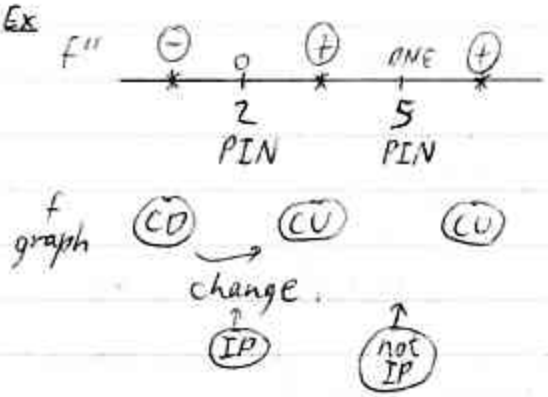
④ Skeleton graph for f, y-int



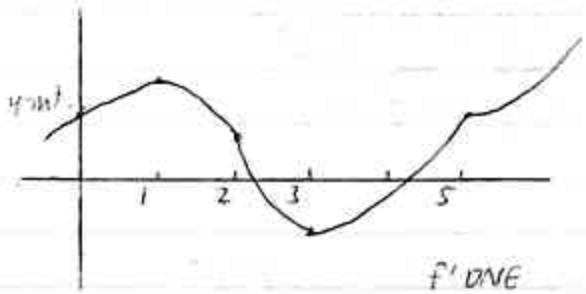
⑤ Find f'', PINs
in ①
where f'' = 0 or DNE

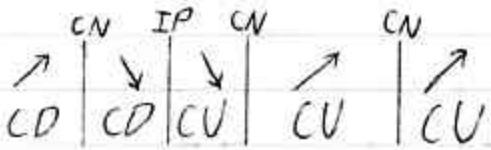
⑥ Sign Diagram for f''
Find IPs

Ex



⑦ Sketch graph of f
Label CNs, IPs
Use ④





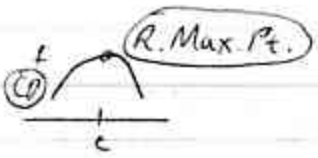
Windows

The one bridge between f', f'' issues

f' ⇓ CNs ⇒ f'' ⇓ 2nd DT ⇓ or ⇓ R.Max, R.Min., Neither

2nd DT

also used to classify pts. at CNs $f'=0$ (c = CN)

If f'' ⊖ ⇒ 

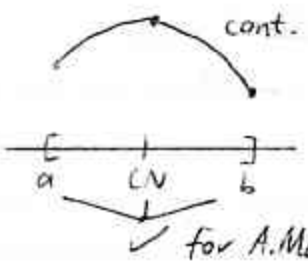
⊕ ⇒ 

⓪ or DNE ⇒ Test useless!

(3.3) Optimiz'n

Find A. Max./Min. Pts.

① EVT



x	f(x)
a	
CNs in (a,b)	
b	

} Compare

② If f cont., only 1 CN...

Classify pt. there using 2nd DT (?)

If R.Max.Pt. ⇒ also A.Max.Pt.
Min. Min.

Max. Profit, $P(x)$

Rev. = (Unit price)(Qty.)
$R(x) = p(x) \cdot x$

Profit = Rev. − Cost
$\boxed{P(x) = R(x) - C(x)}$

Steps

Read
Diagram, Define Vars
Max/Min What?
  Primary Eq. → $f(x) = \ldots$
Secondary Eq(s).
Domain?
Optimize f
  Find CNs
  Verify A. Max./Min. Pts.
  Answer the ?, Units

(3.6) Imp. Diff.

Ex Want $\frac{dy}{dx}$, but y "buried" in an eq.

① D_x each term
Ex $D_x(y^3) = 3y^2 y'$
(tail)

② Isolate terms w/ y'
③ Factor out y'
④ ÷ to isolate y'

Demand Eqs.
Interpret results

Given values for some vars ⇒ find values of others.

Related Rates
Define vars
Organize info
Given: ?
Find: ? when ?
D_t
① often an underlying var.
Tails!
After D_t, plug in known values
Interpret, Units