P. 215 #37

$y = xe^x$

$y' = xe^x + e^x$

$y'' = xe^x + e^x + e^x$

$= xe^x + 2e^x$

Cr#

$xe^x + e^x = 0$

$\frac{xe^x}{e^x} = \frac{e^x}{e^x}$

$x = -1$

$f''(-1) = -e^{-1} + 2e^{-1}$

$= -\frac{1}{e} + \frac{2}{e}$

$= \frac{1}{e}$

$f''(-1) > 0$, then $f(x)$ conc ↑

A local min @ $x = -1$.

P. 215 #39

$y' = (x-1)^2(x-2)$

$y'' = (x-1)^2(1) + (x-2)\cdot 2(x-1)(1)$

$= (x-1)^2 + 2(x-1)(x-2)$

$= (x-1)\left[(x-1) + 2(x-2)\right]$

$(x-1)(x-1+2x-4)$

$y'' = (x-1)(3x-5)$

f'' + | − | +

f conc↑ | conc↓ $\frac{5}{3}$ conc↑

CR #s: $x = 1, 2$

f' − | − | +

f dec | dec | 2 | inc

Local min @ $x = 2$

No local max

POIs @ $x = 1, \frac{5}{3}$