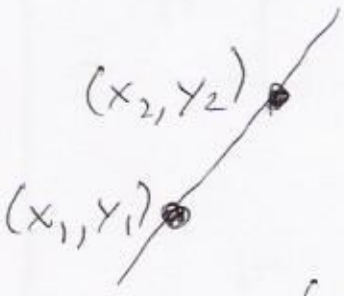
9/28
- Story problems... (4-3)
- Extendend office hours: (CH 313C)
  9:30 – 3:00 & 4:00 – 6:00

9/29 Review session 11AM (Room TBA)

9/30
- More story problems or start Ch. 5
- Office 9:30 – 12:30

10/3 Test II: Bring calculator & a sheet of notes (double-sided).

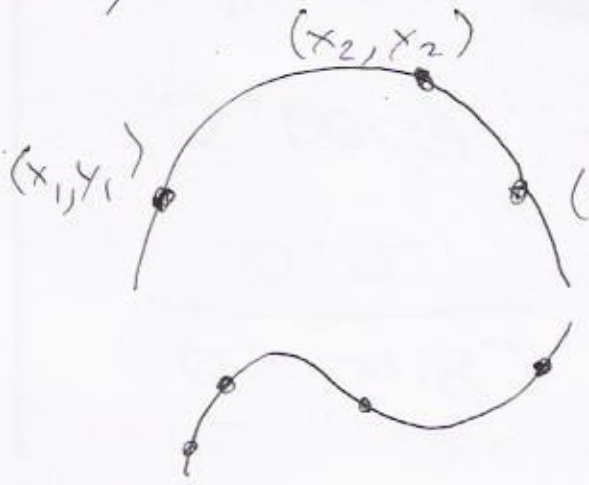
(4-3) #81



2 points determine a line

$y_1 = ax_1 + b$
$y_2 = ax_2 + b$ } Solve for a & b.

line: $y = ax + b$.



3 pts. determine a parabola

$y = ax^2 + bx + c$

4 pts determine a cubic curve.

$$\left.\begin{aligned} y_1 &= ax_1^2 + bx_1 + c \\ y_2 &= ax_2^2 + bx_2 + c \\ y_3 &= ax_3^2 + bx_3 + c \end{aligned}\right\}$$ Solve for a, b, c

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x = time in years since 1900

y = US population in millions

x	y	x^2
0	75	0
50	150	2500
100	275	10000

$0 \cdot a + 0 \cdot b + c = 75$

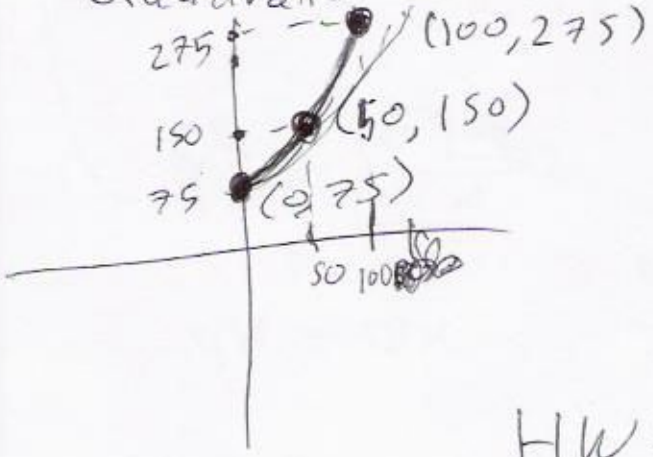
$2500 \cdot a + 50b + c = 150$

$10000a + 100b + c = 275$

$$\begin{bmatrix} 0 & 0 & 1 & 75 \\ 2500 & 50 & 1 & 150 \\ 10000 & 100 & 1 & 275 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 0 & 1/100 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 75 \end{bmatrix}$$

$a \quad b \quad c$

Quadratic model: $y = \frac{1}{100}x^2 + x + 75$



Predict y when $x = 150$:

$y = \frac{1}{100}(150)^2 + 150 + 75 = 450$

HW: #82 (4-3)

F = federal tax ← #71 (4-3)

S = state tax

L = local tax

Tax liability (in percentage terms) $= \frac{F+S+L}{7{,}650{,}000} \cdot 100\%$

Find F, S, and L.

Then compute tax liability.

$F = (50\%)(7{,}650{,}000 - S - L)$

$S = (20\%)(7{,}650{,}000 - F - L)$

$L = (10\%)(7{,}650{,}000 - F - S)$

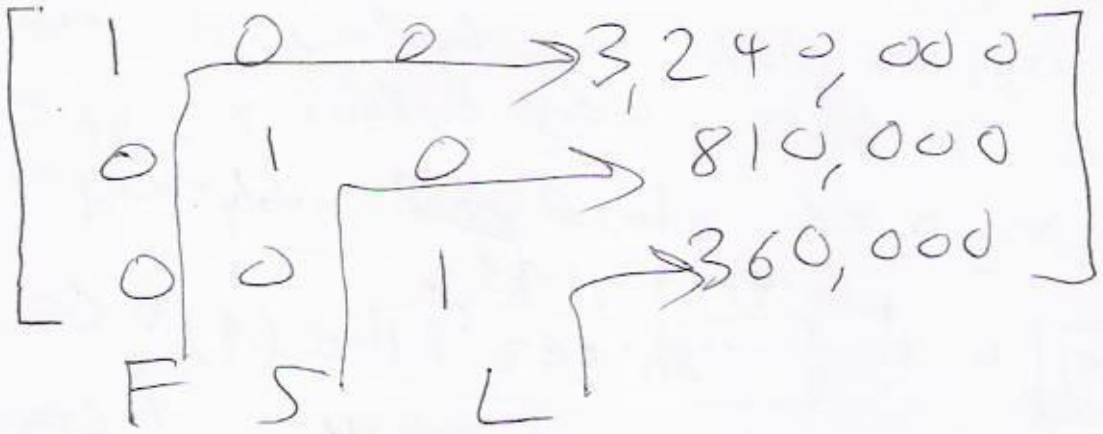
Get variables on the left side

$F + 0.5S + 0.5L = 3{,}825{,}000$

$0.2F + S + 0.2L = 1{,}530{,}000$

$0.1F + 0.1S + L = 765{,}000$

$$\begin{bmatrix} 1 & 0.5 & 0.5 & 3825000 \\ 0.2 & 1 & 0.2 & 1530000 \\ 0.1 & 0.1 & 1 & 765000 \end{bmatrix}$$



tax liability = 57.6%

HW (4-3) #73, 89