

~~Problem 1~~

x	y
2	1
5	8
7	3

$$a_1 x^2 + b_1 x + c_1 = 1$$

$$a_1 5^2 + b_1 5 + c_1 = 8$$

$$a_2 x^2 + b_2 x + c_2 = 8$$

$$a_2 7^2 + b_2 7 + c_2 = 3$$

$$2, a_1 x + b_1 = 2a_2 x + b_2$$

$$2a_1 x + b_1 - 2a_2 x - b_2 = 0$$

$$2a_1 5 + b_1 - 2a_2 5 - b_2 = 0$$

$$a_1 = 0$$

OK

$$4a_1 + 2b_1 + c_1 = 1 \rightarrow (i)$$

$$25a_1 + 5b_1 + c_1 = 8 \rightarrow (ii)$$

$$25a_2 + 5b_2 + c_2 = 8 \rightarrow (iii)$$

$$49a_2 + 7b_2 + c_2 = 3 \rightarrow (iv)$$

$$10a_1 + b_1 - 10a_2 - b_2 = 0 \rightarrow (v)$$

$$a_1 = 0 \rightarrow (vi)$$

6 eqs 6 unknown \rightarrow Unique solution

Consider eq (i) and (ii) $a_1 = 0$

$$\Rightarrow \begin{array}{r} 2b_1 + c_1 = 1 \\ + 5b_1 + c_1 = 8 \end{array}$$

$$-3b_1 = -7$$

$$b_1 = \frac{7}{3}$$

put b_1, a_1 in eq (i) to get c_1

$$2\left(\frac{7}{3}\right) + c_1 = 1$$

$$\Rightarrow c_1 = 1 - \frac{14}{3}$$

$$c_1 = -\frac{11}{3}$$

$$c_1 = -3.667$$

Consider eq (iii) and (iv)

$$25a_2 + 5b_2 + c_2 = 8$$

$$+ 49a_2 + 7b_2 + c_2 = 3$$

$$-24a_2 - 2b_2 = 5 \rightarrow \text{eq (A)}$$

$$[25]$$

$$S_0 = 2.33x - 3.67$$

$$c_1 = -2.42x - 26.5x -$$

$$\frac{7}{3} - 10a_2 - b_2 = 0$$

$$b_2 = -10a_2 + \frac{7}{3}$$

$$b_2 = 10(-2.42) + \frac{7}{3}$$

$$b_2 = -26.5$$

$$25(-2.42) + 5(-26.5) + c_2 = 8$$

$$-3 = c_2$$

Consider eq (v) putting the values of a_1, b_1 meet

$$\frac{7}{3} - 10a_2 - b_2 = 0$$

(B)

Using eq (A) and (B) meet

$$\begin{array}{r} -24a_2 - 2b_2 = 5 \\ 2(-10a_2 - b_2 = \frac{7}{3}) \end{array}$$

$$\begin{array}{r} -24a_2 - 2b_2 = 5 \\ -20a_2 - 2b_2 = \frac{7}{3} \\ \hline -4a_2 = 5 + \frac{14}{3} \end{array}$$

$$-4a_2 = \frac{15+14}{3}$$

$$-4a_2 = \frac{29}{3}$$

$$\Rightarrow a_2 = -\frac{29}{12}$$