

Days
PeriodClass
Subject

class B.tech 2nd yrs (E.C.E)
 Subj Signal & System
 Faculty: mandeep Singh
 Date: 28/4/2020

Topic: Numerical on the
 Basis of property

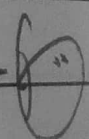
Q.1 Given two sequence of length 4

$$x(n) = \{0, 1, 2, 3\}$$

$$h(n) = \{2, 1, 1, 2\}$$

Acc. to definition of circular convolution

$$y(m) = \sum_{n=0}^{N-1} x_1(n) \cdot x_2((m-n))$$

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Vice Principal

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given seq. are $x(n)$ and $h(n)$. The lengths
is 4 means $N=4$. Thus eq (1) becomes

$$y(m) = \sum_{n=0}^3 x(n) \cdot h((m-n))_4$$

Step 1:

Draw $x(n)$ and $h(n)$.

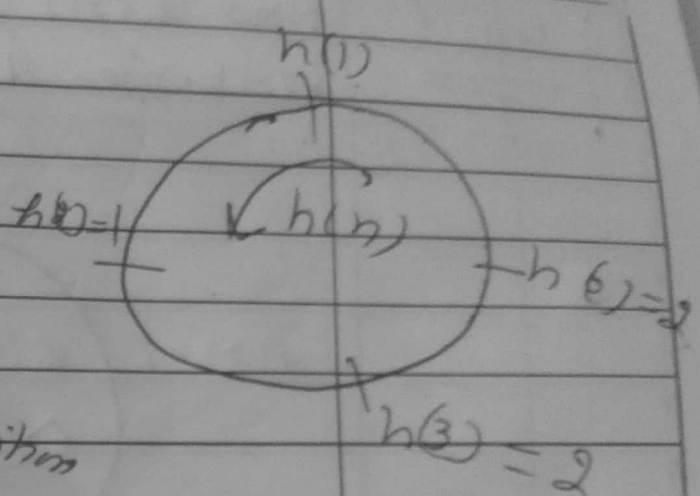
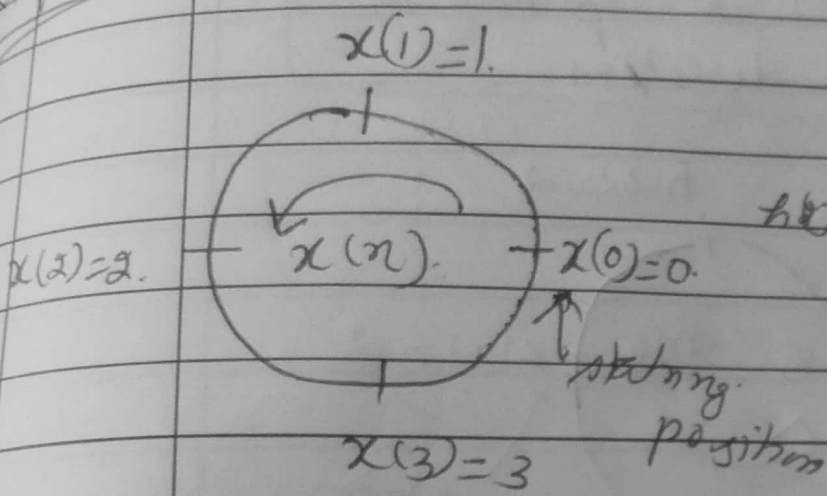


Fig 1: $x(n) = \{0, 1, 2, 3\}$

Fig 2: $h(n) = \{2, 1, 2, 2\}$

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Step II:

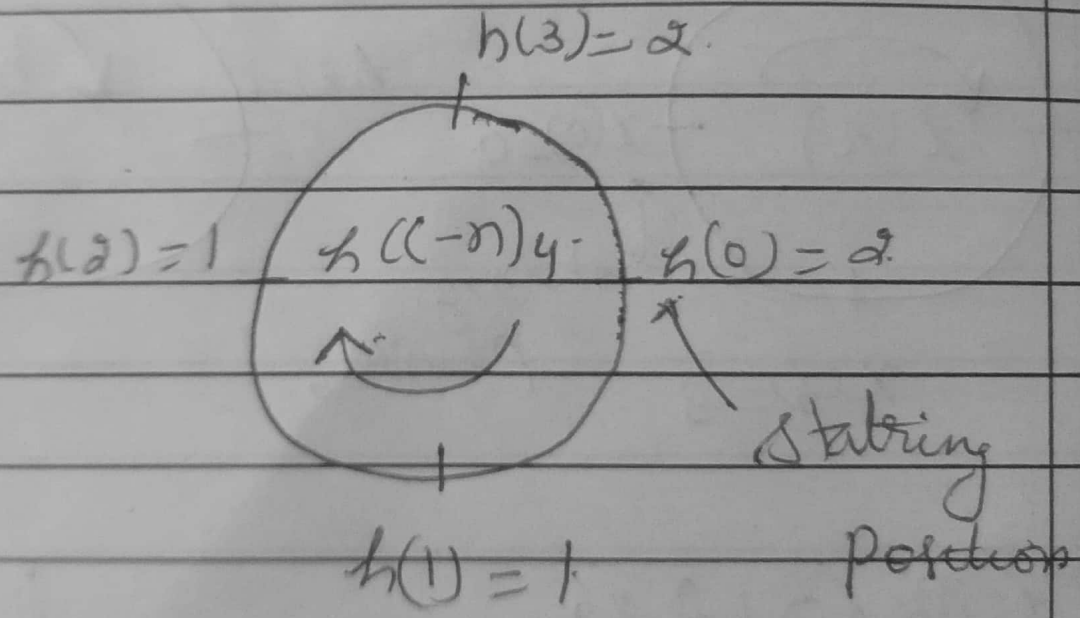
Calculation of $y(0)$:-

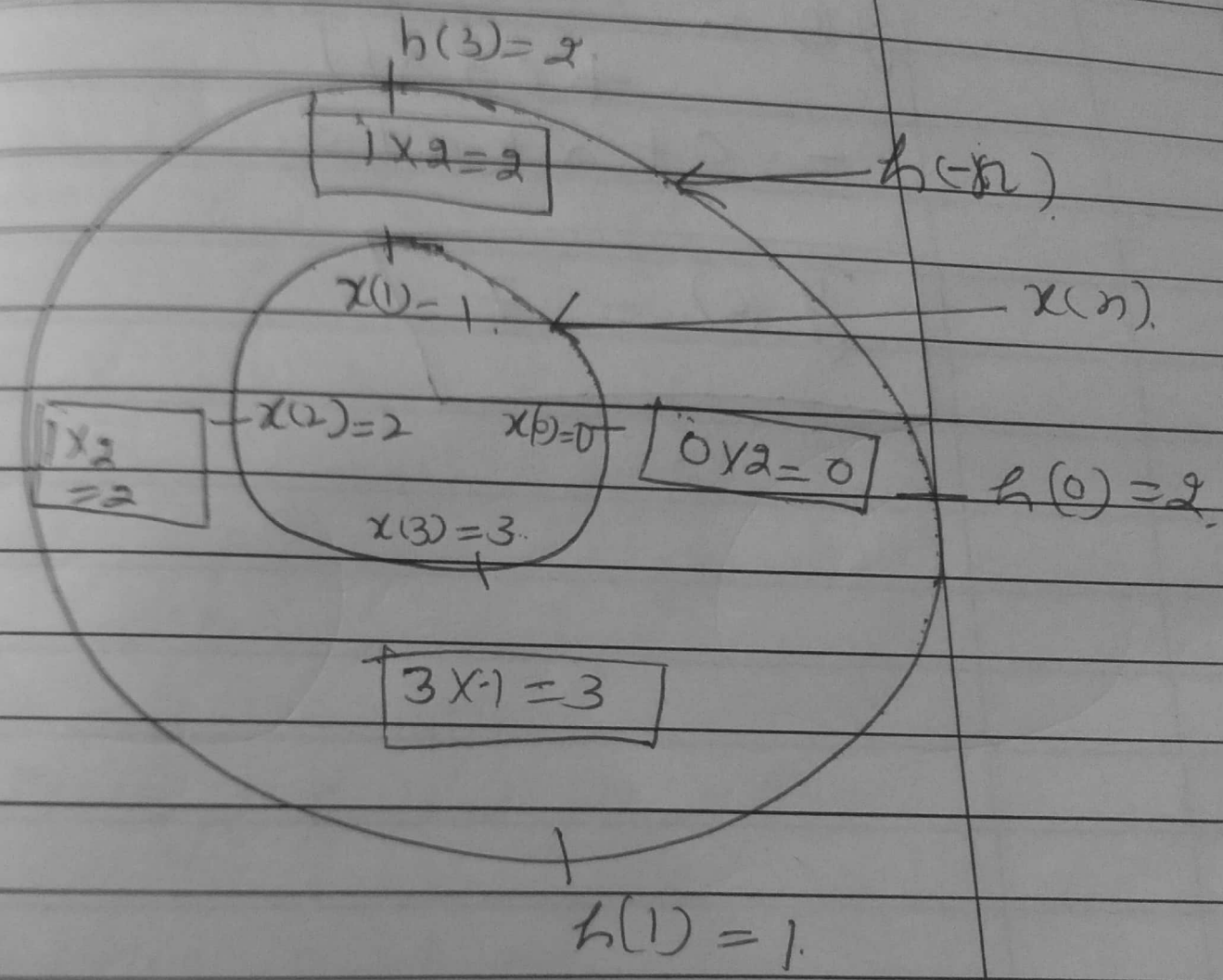
Putting $m=0$ in eq. (2)

$$y(0) = \sum_{n=0}^3 x(n) \cdot h((-n])_4$$

Note:

Now $h(n)$ is plotted in clockwise direction





$h(2) =$

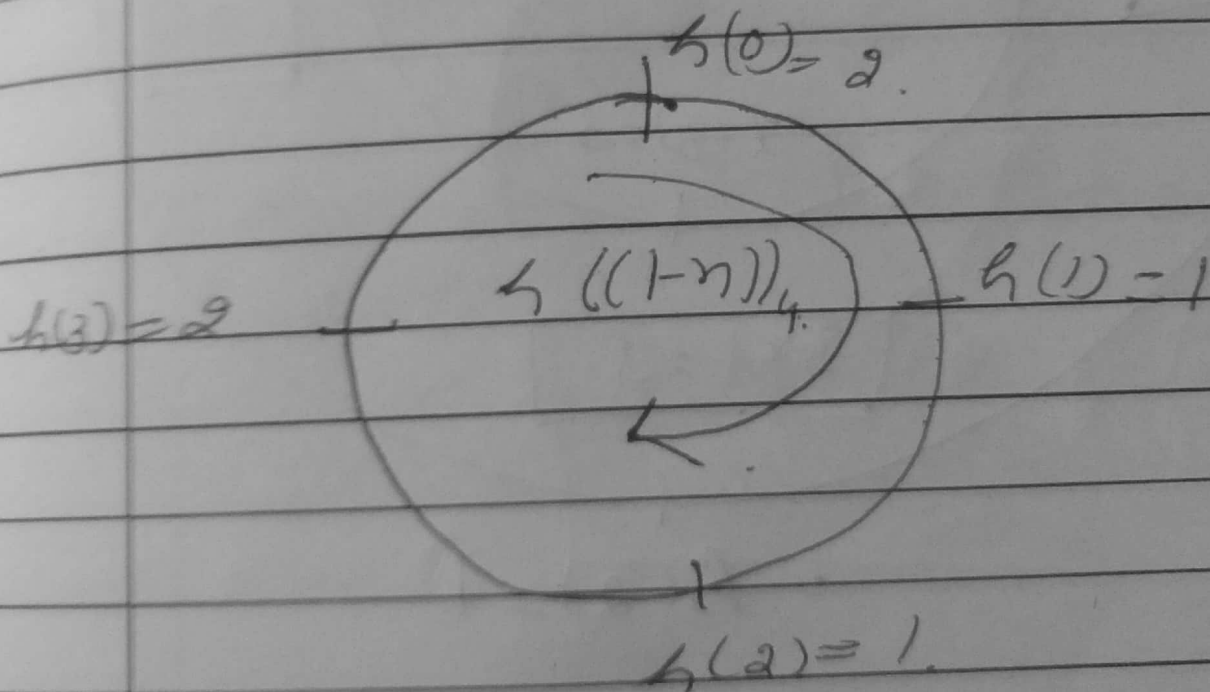
Planning for to

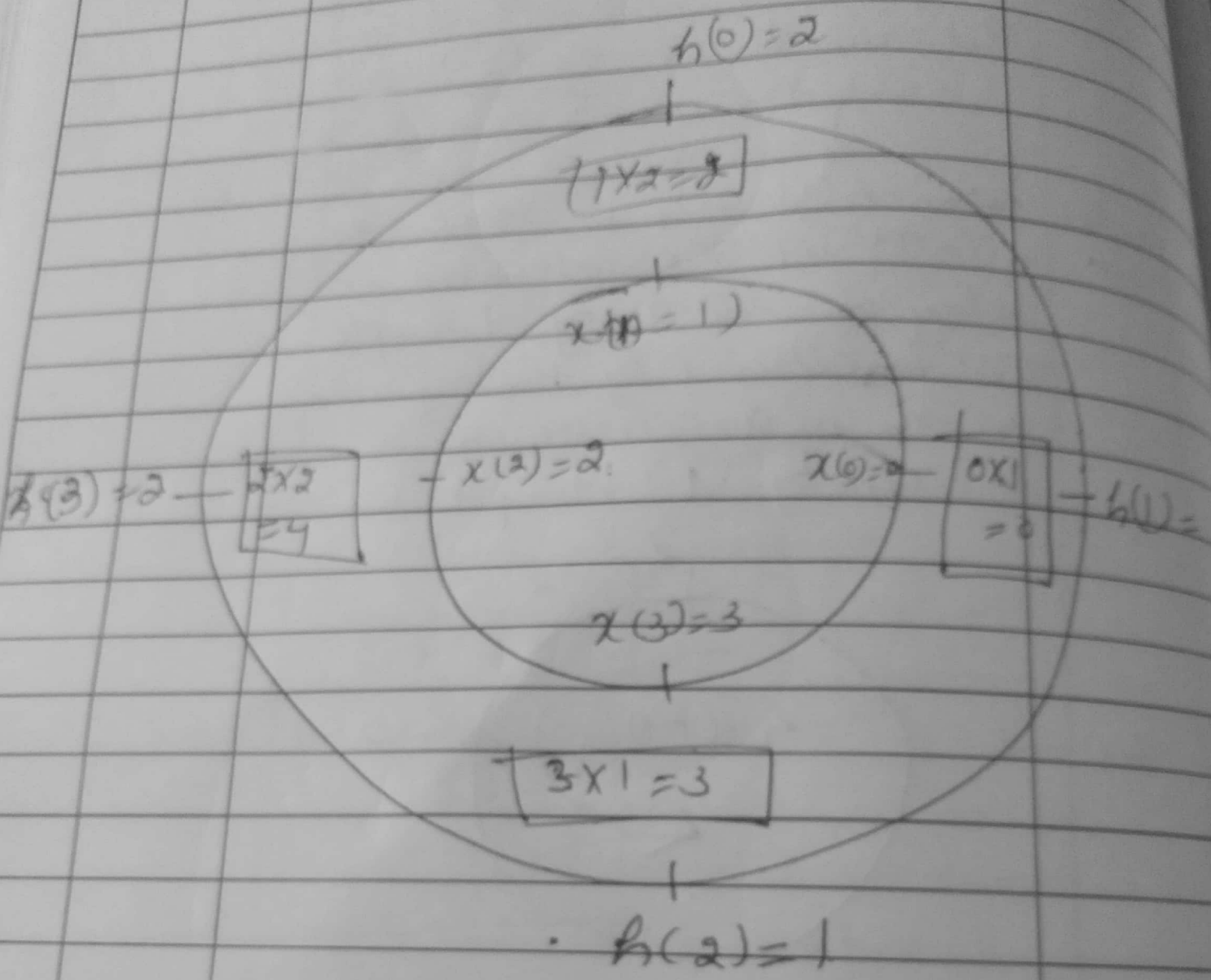
| Days Period | Class Subject | Class Work Forecast | Home Work |
|----------------|------------------|--|-----------|
| | | then $y(6)$ is obtained by adding all product terms | |
| | | $\therefore y(6) = (0 \times 2) + (1 \times 2) + (1 \times 2) + (3 \times 1)$ $= 0 + 2 + 2 + 3.$ | |
| | | $y(6) = 7$ | |

calculation of $y(1)$:-

Put $m=1$ in eq (2)

Note: here $h((-n+1))_4$ is same as $h((-n))_4$. This indicates delay of $h((-n))_4$ by 1 sample. This is obtained by shifting $h((-n))_4$ in anticlockwise direction by 1 sample.





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$$y(1) = (0 \times 1) + (3 \times 1) + (2 \times 2) + (1 \times 2)$$

$$= 0 + 3 + 4 + 2$$

$$\therefore y(1) = 9$$

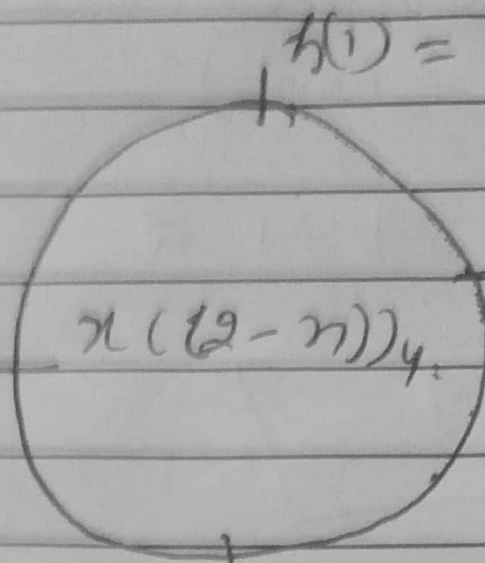
Step - iv Calculation of $y(2)$

Put $m = 2$ in eq. (2).

$$y(2) = \sum_{n=0}^3 x(n) h((2-n))_4$$

New starting
position

$$h(0) = 2$$



$$h(1) = 1$$

$$h(2) = 1$$

$$h(3) = 2$$

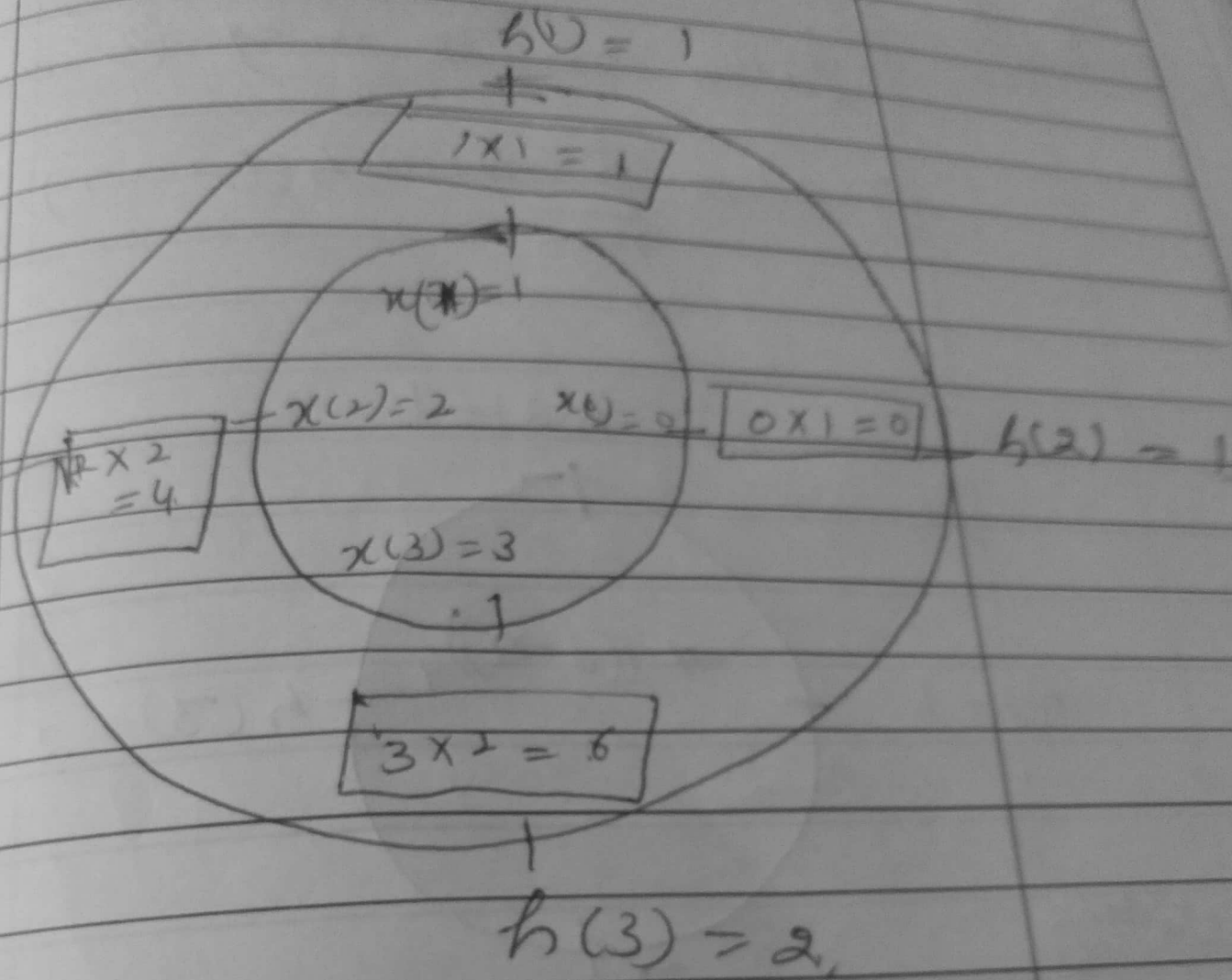
$$\therefore y(2) = (0 \times 1) + (3 \times 2) + (2 \times 2) + (1 \times 1)$$

$$= 0 + 6 + 4 + 1$$

$$\therefore y(2) = 11$$

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Home Work



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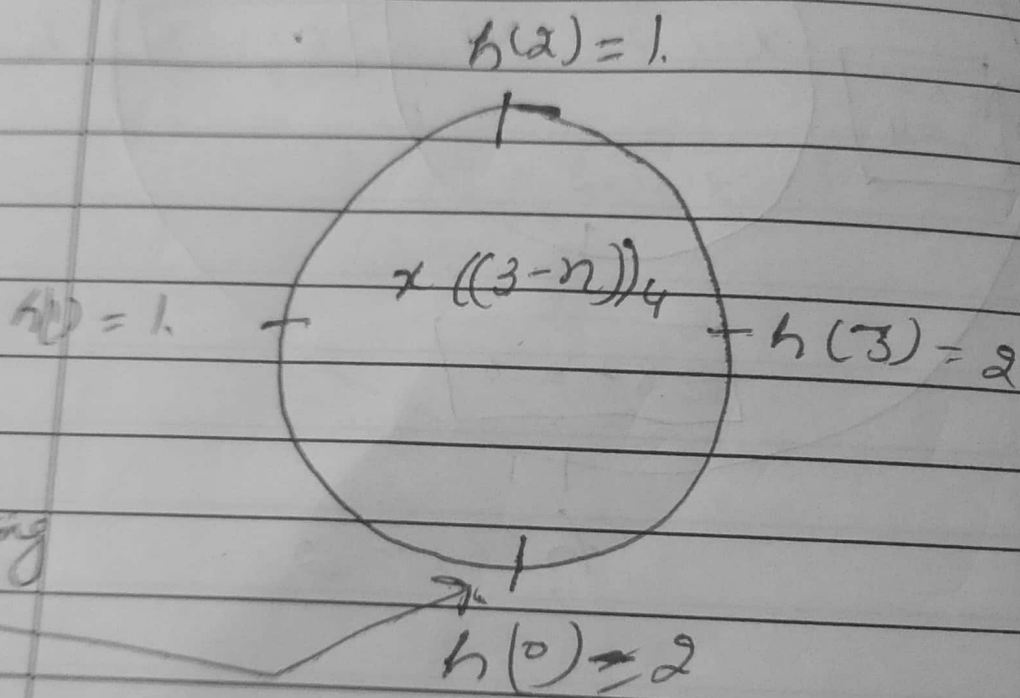
Step

7

calculation of $y(3) =$

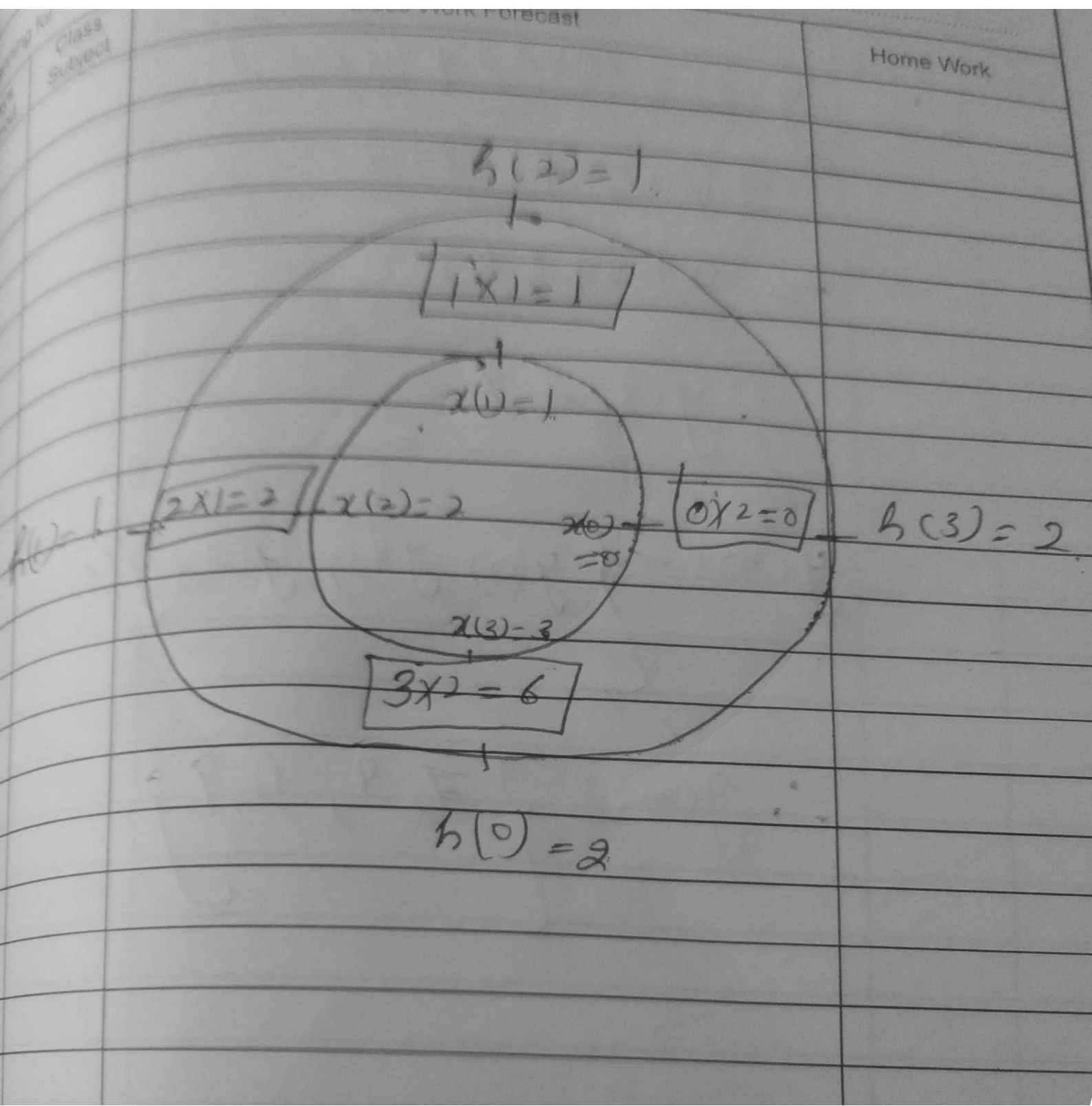
Putting $m=3$ in eq. (2) we get.

$$y(3) = \sum_{n=0}^3 x(n) \cdot h((3-n))_4$$



New starting
position

emarks :



$$y(3) = (0 \times 2) + (3 \times 2) \\ + (2 \times 1) + (1 \times 1)$$

$$= 0 + 6 + 2 + 1$$

$$\therefore y(3) = 9$$

$$y(m) = \{ y(0), y(1), y(2), y(3) \}$$

$$\therefore y(m) = \{ 7, 9, 11, 9 \}$$