

# Linear Interpolation

Problem 1: If price of 2 pen is 6 taka and price of 13 pen is 39 taka then find the price of 7 pen.

Solution:

$$\text{Price of 1 pen} = \frac{6}{2} = \frac{39}{13} = 3 \text{ taka}$$

$$\text{Price of 7 pen} = 3 * 7 = 21 \text{ taka}$$

(Ans)

# Linear Interpolation

Problem 2: If price of 2 pen is 8 taka and price of 13 pen is 41 taka then find the price of 7 pen.

Solution:

$$\text{Price of 1 pen} = \frac{8}{2} \neq \frac{41}{13}$$

**(In trouble)**

# Linear Interpolation

Problem 1: If price of 2 pen is 6 taka and price of 13 pen is 39 taka then find the price of 7 pen.

Solution: Given , Price of 2 pen is 6 taka

Extra (13-2) pen costs extra (39-6) taka

Extra 1 pen costs extra  $\frac{(39 - 6)}{(13 - 2)}$  taka

Extra (7-2) pen costs extra  $\frac{(39 - 6)}{(13 - 2)} (7-2)$  taka

So, cost of 7 pen =  $6 + \frac{(39 - 6)}{(13 - 2)} (7-2) = 21$  taka

# Linear Interpolation

Problem 2: If price of 2 pen is 8 taka and price of 13 pen is 41 taka then find the price of 7 pen.

Solution: Extra 1 pen costs  $\frac{(41 - 8)}{(13 - 2)}$  taka

Extra (7-2 ) pen costs  $\frac{(41 - 8)}{(13 - 2)} (7-2)$  taka

Price of 7 pen =  $8 + \frac{(41 - 8)}{(13 - 2)} (7-2)$  taka

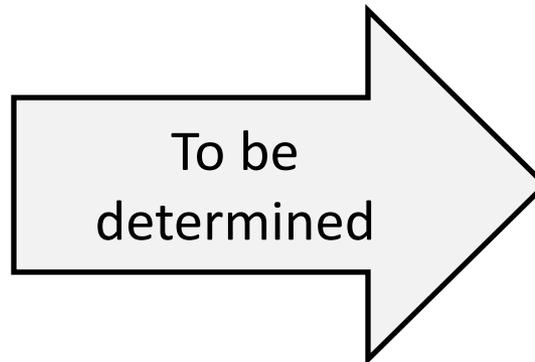
= 23 taka

# Interpretation of problem 2

Price of 7 pen

$$= 8 + \frac{(41 - 8)}{(13 - 2)} (7-2) \text{ taka}$$

$$= 23 \text{ taka}$$



No of pen (N)	Price (P)
2	8
<i>7</i>	<i>23</i>
13	41

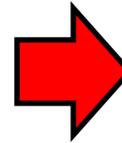
# Linear Interpolation

Value of P(= y) when N = x:

$$y = b + \frac{(d - b)}{(c - a)} (x - a)$$

Or, it can be written as:

$$\frac{(y - b)}{(x - a)} = \frac{(d - b)}{(c - a)}$$



(N)	(P)
a	b
x	y
c	d