

0/차함수 합승값 찾기

- 증가량(t) 공식

$$f(x)=h, f(n)=a, f(m)=b \quad (m-n>1)$$

$$f(n+1)-f(n)=t$$

$$b = a + (m-n)t + \sum_{i=1}^{m-n-1} h_i$$

$$(m-n)t = b-a - \sum_{i=1}^{m-n-1} h_i$$

$$t = \frac{b-a - \sum_{i=1}^{m-n-1} h_i}{m-n}$$

ex. 1)

$$f(x) = 2x^2 + 5x$$

$$f'(x) = 4$$

$$f(2) = 18$$

$$f(4) = 52$$

$$t = \frac{52-18 - \sum_{i=1}^{4-2-1} 4i}{4-2} = \frac{34-4}{2} = 15 = f(3) - f(2)$$

$$\begin{array}{cccccc}
 f(2) & f(3) & f(4) & f(5) & f(6) & \dots \\
 18 & 33 & 51 & 74 & 101 & \dots \\
 \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \\
 15 & 19 & 23 & 27 & \dots & \\
 \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \\
 4 & 4 & 4 & \dots & \dots &
 \end{array}$$

ex. 2)

$$f(x) = 3x^2 + 5$$

$$f'(x) = 6$$

$$f(1) = 8$$

$$f(5) = 80$$

$$\begin{aligned}
 L &= \frac{80 - 8 - \sum_{i=1}^{5-1} 6i}{5-1} = \frac{112 - 36}{4} \\
 &= 9 \\
 &= f(2) - f(1)
 \end{aligned}$$

$$\begin{array}{ccccccccc}
 f(1) & f(2) & f(3) & f(4) & f(5) & \dots & & & \\
 8 & 17 & 32 & 53 & 80 & & & & \\
 \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & & & & \\
 9 & 15 & 21 & & 27 & \dots & & & \\
 \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & & & & \\
 6 & 6 & 6 & & 6 & \dots & & &
 \end{array}$$

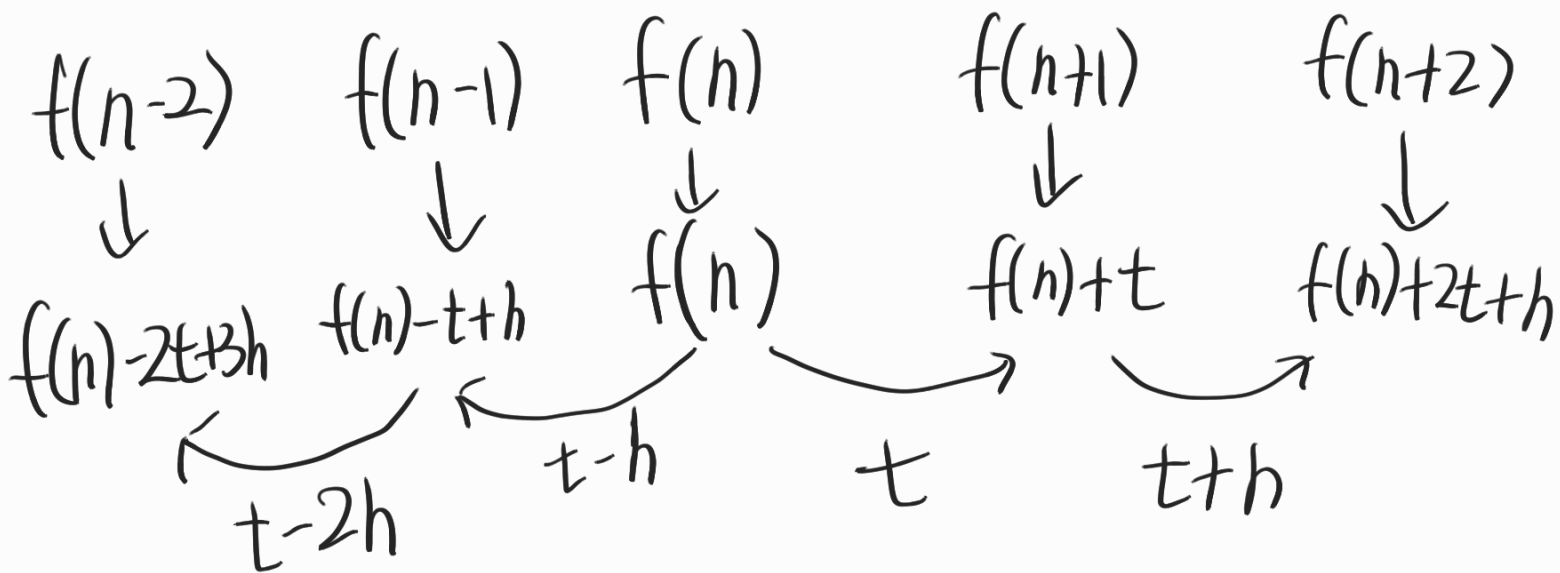
이것도 함수와 두 개의 함수값을
 알고 있으면 쉽게 다른 함수값도 찾을 수 있음.

- 함수값 공식

$$f'(x)=h, \quad f(n)=a, \quad t=f(n+1)-f(n)$$

$$f(x)=a+(x-n)t+\sum_{i=1}^{m-n-1} h_i \quad (x > n)$$

$$f(x)=a+(x-n)t+\sum_{i=1}^{m-n-1} h_i \quad (x < n)$$



ex)

$$f(x) = 2x^2 + 5x$$

$$f''(x) = 4$$

$$f(1) = 7$$

$$f(5) = 75$$

$$t = \frac{b-a - \sum_{i=1}^{m-h-1} h_i}{m-h} = \frac{75-7 - \sum_{i=1}^{5-1-1} 4i}{5-1} = \frac{68-24}{4} = 11$$

$$f(x) = a + (x-n)t + \sum_{i=1}^{|x-h-1|} h_i \quad (x > h)$$

$$f(x) = a + (x-n)t + \sum_{i=1}^{|x-h|} h_i \quad (x < h)$$

$$f(38) = 7 + (38-1)t + \sum_{i=1}^{|38-1-1|} 4i$$

$$= 7 + 37t + 2664$$

$$= 37 \times 11 + 2671$$

$$= 407 + 2671 = 3078$$