이차함수 함숫값 찾기

- 증가량(t) 공식

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

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

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

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

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

ex.1)

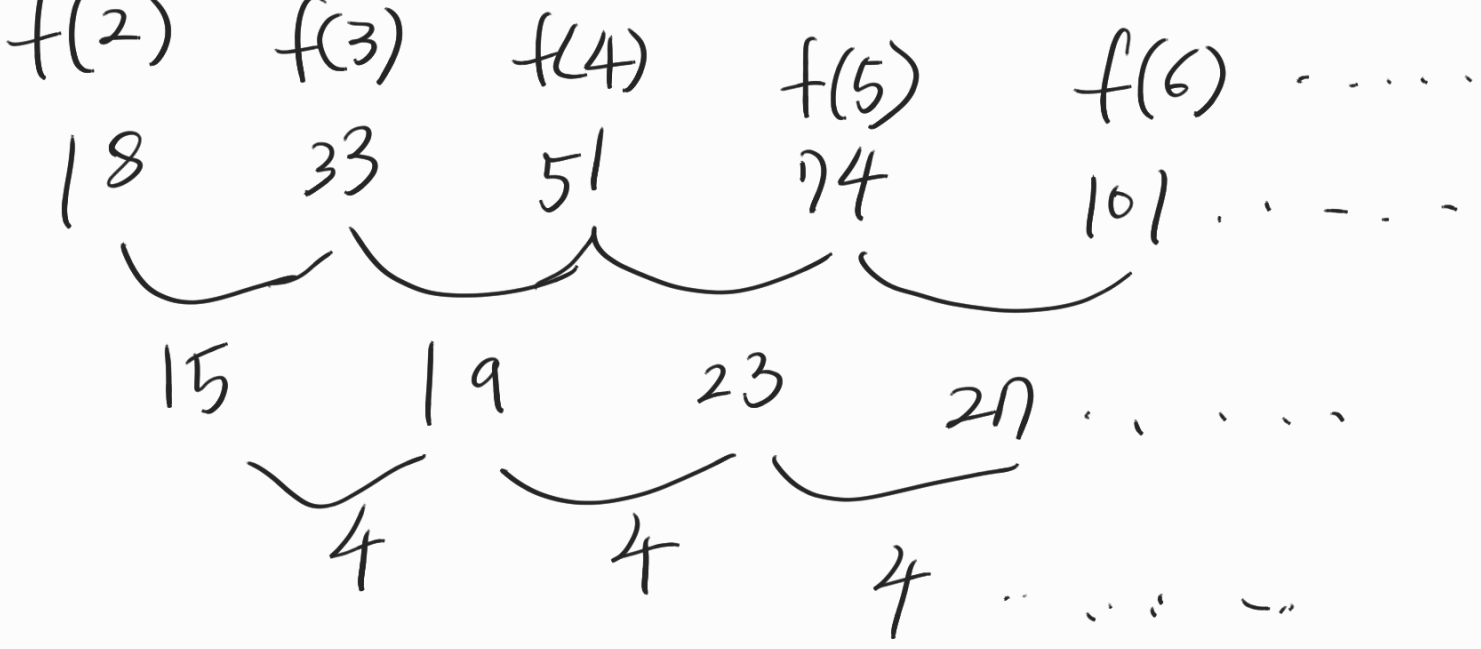
$f(x)=2x^2+5x$

$f''(x)=4$

$f(2)=18$

$f(4)=52$

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



ex.2)

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

$f'(x) = 6$

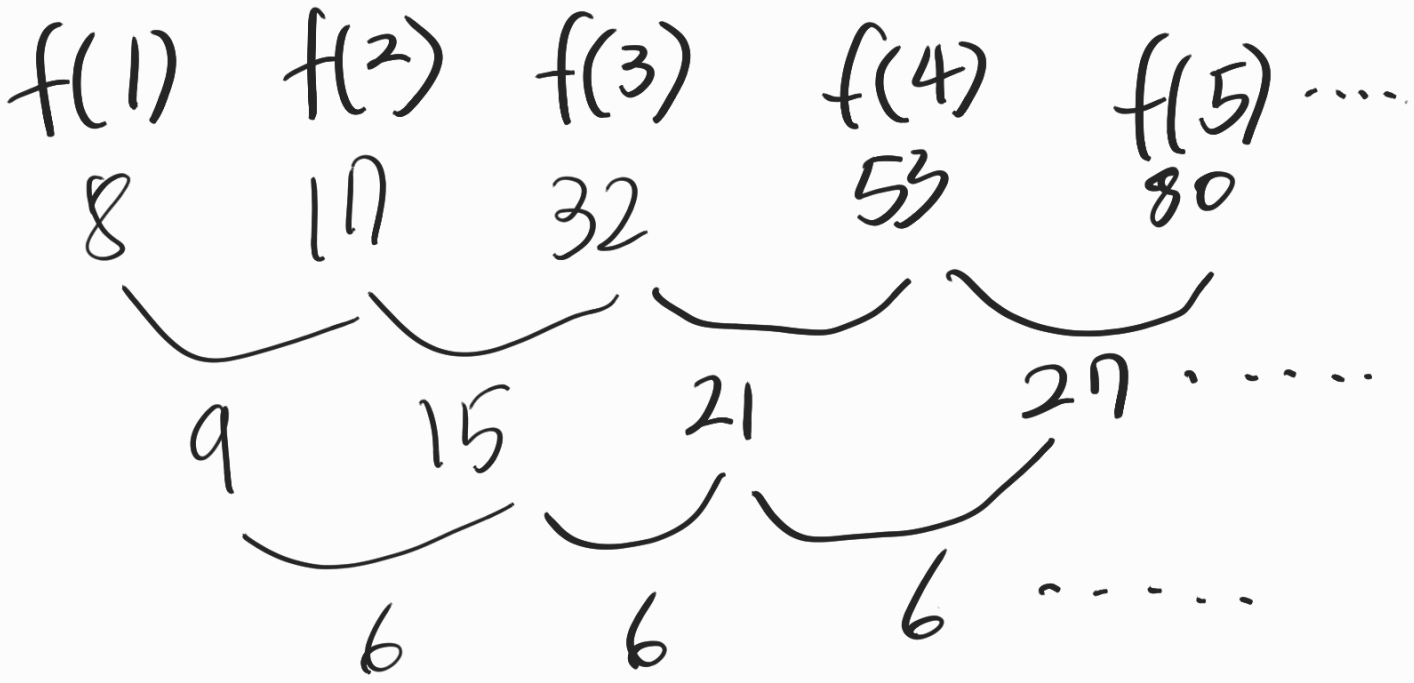
$f(1) = 8$

$f(5) = 80$

$$t = \frac{80 - 8 - \sum_{i=1}^{5-1-1} 6i}{5-1} = \frac{72 - 36}{4}$$

$= 9$

$= f(2) - f(1)$



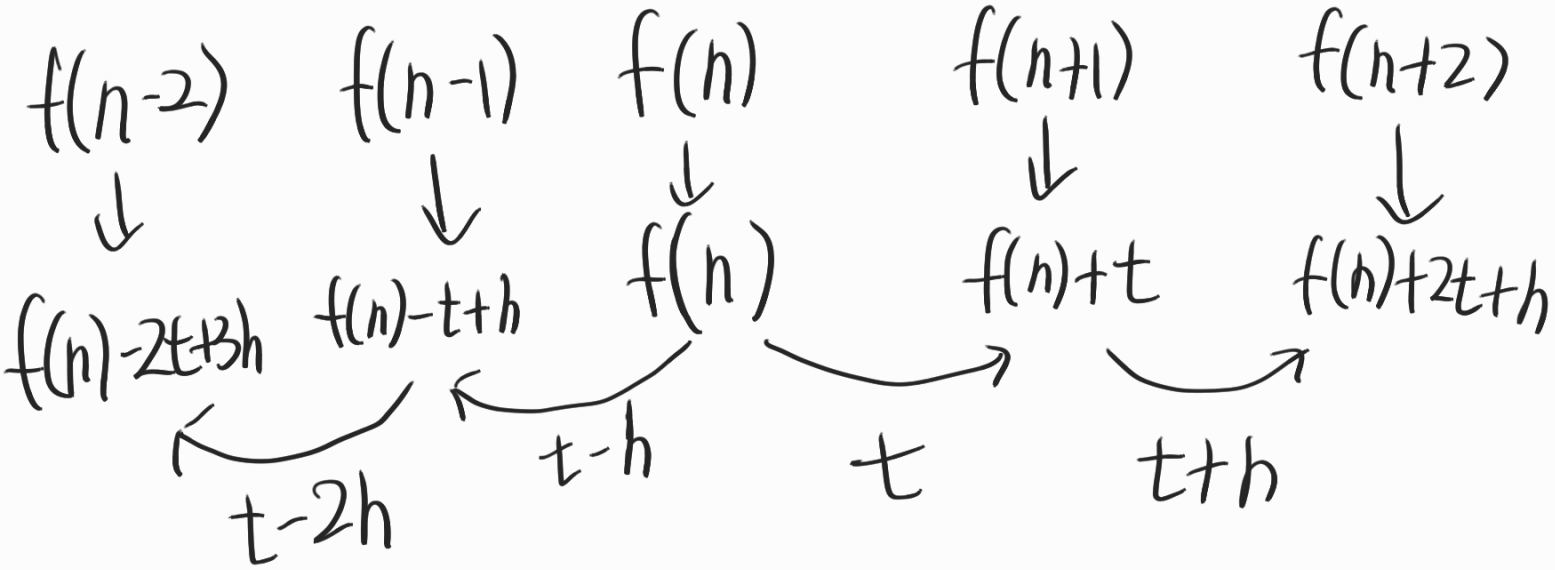
이처도 함수와 두 개의 함숫값을
알고 있으면 쉽게 다른 함숫값도 칠을 수 있음.

함숫값 공식

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

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

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



ex)

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

$f''(x)=4$

$f(1)=7$

$f(5)=75$

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

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

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

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

$$=7+37t+2664$$

$$=370\times 11+2671$$

$$=407+2671=3078$$