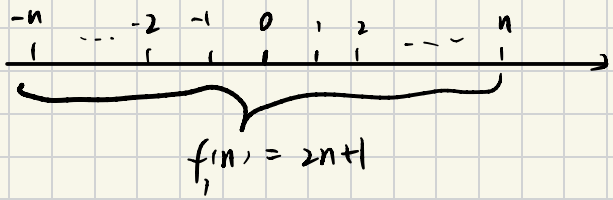
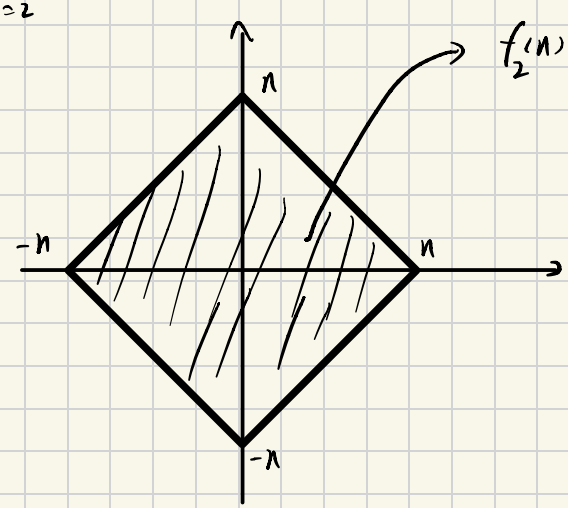
9.

$k=1$



$f_1(n) = 2n+1$

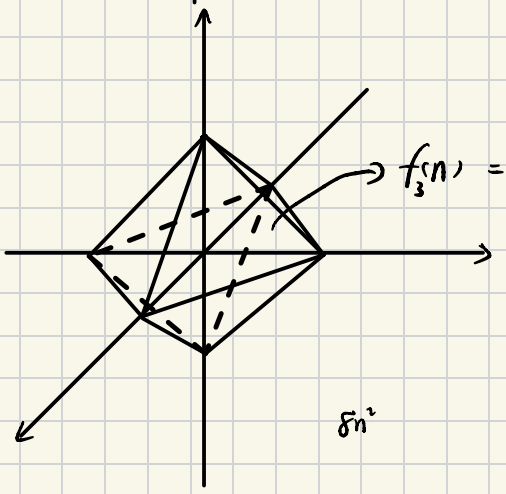
$k=2$



$f_2(n) = S + 2n+1$

$= 2n^2 + 2n+1$

$k=3$



$f_3(n) = V + 2n^2+2n+1$

$8n^2$

$k=k$ $\quad f_k(n) = V_k + f_{k-1}(n)$

$= (2n)^k + f_{k-1}(n)$

$f_k(n) = 2^k + 4^k + \cdots + (2n)^k$

$$\frac{f(n-1)}{f(n)} = \frac{2^k + 4^k + \cdots + (2n-2)^k}{2^k + \cdots + (2n)^k}$$

$$\leq \frac{2^k + \cdots + (2n)^k}{2^k + \cdots + (2n+2)^k} = \frac{f(n)}{f(n+1)}$$

10. $\lambda^n \leq \frac{n}{\ln 2}\lambda^{n-1}$