

$$2 \left(\frac{1}{n+1} \right) - \frac{1}{(n+1)^2} \leq 2/n+2.$$

~~$$\frac{2(n+1)^2}{n+1}$$~~

~~$$2 \nmid k+1$$~~

$$\frac{(2(n+1) - 1)(k+2)}{k+1} \leq 2(n+1)^2.$$

~~$k+1$~~

$$(2k+1)(n+2) \leq 2(n+1)^2.$$

$$2k^2 + 5k + 2 \leq 2n^2 + 4n + 2!$$

$$\alpha \left(\frac{1}{n+1} \right) - \frac{1}{(n+1)^2} \leq \frac{\alpha}{n+2}$$

found
s.t. two
sub

$$\frac{(2(k+1) - 1)(n+2)}{(n+2)} \leq 2(n+1)^2.$$

$$(\alpha k + \alpha - 1)(n+2) \leq \alpha(n^2 + 2n + 1)$$