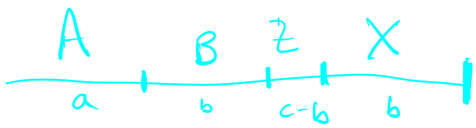
Let



$\delta < 1$

$* \quad ABZ$

Invs

$\mu A \leq n - a$

$\mu AB \leq n - P.$

$\mu ABZ \leq n - K$

$\mu ABZX \leq n - K - b$

clm

Invs $\Rightarrow *$

Consider the special case $\delta = 0$

then everything in $B \geq X$

has the same fill

in particular d,

$$\frac{mA + xv}{a+x} \leq n - a - x$$

$$v \leq \frac{(n-a-x)(a+x) - mA}{x}$$

$$m_f = mABE + b$$

$$\boxed{x = c + b}$$

$$m_f = mA + cV + b$$

$$M_f \le mA\left[1 - \frac{b}{x}\right] + c\,\frac{(n-(a+x))(a+x)}{x} + b.$$

$$M_f \le mA\,\frac{b}{b+c} + mABE\,\frac{c}{b+c} + b.$$

make them extremal.

$$\frac{b\,a(n-a) + c(a+b+c)(n-a-b-c)}{b+c}$$

$$\frac{nab - a^2 b + c(a+b+c)n - c(a+b+c)^2}{b+c}$$

$$\frac{n(ab + c(a+b+c)) - a^2 b - c(a+b+c)^2}{b+c}$$

$$\frac{n\left[a(b+c)+c(b+c)\right]-\left[a^2b+c(a+b+c)^2\right]}{b+c}$$

$$nk - \frac{a^2b+(k-a)(b+k)^2}{b+k-a}$$

$nk + ab - b - k^2.$

$$a^2b + \begin{matrix} kb^2 + k2bk + kk^2 \\ -ab^2 - a2bk - ak^2 \end{matrix}$$

$a \qquad -b \qquad -k$

$k(b^2+2bk+k^2-ak-ab)$

$k^2(b+k-a)$

$b^2+bk-ab.$

$b(b+k-a).$

$\cancel{nk - k^2 + ab - b}$

$$mf = b + \left[ab - k(b+k-n)\right]$$

$$mf = nk - k^2$$

$$-kb + ab + b$$

$$= k(n-k) + b\left[a+1-k\right].$$

which is great

since

$a \neq k$

so $a+1 \leq k$

$$m_f = mA + mC + b$$

$$\le mA + \left[\frac{mABC - mA}{b+c}\right] c + b$$

$$m_f \le \frac{b}{b+c} mA + \frac{c}{b+c} mABC + b$$

Setting every thing extremally negat

$$m_f \le k(n-k) + ab - bk + b$$

$$b(a+1-k) \le 0$$

or $k \ge a+1$

5:33 PM Sun Apr 5 wolframalpha.com 67%

WolframAlpha computational intelligence.

simplify (b/(b+k-a))a(n-a)+((k-a)/(b+k-a))(b+k)(n-b-k)

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Input interpretation:

simplify $\frac{b}{b+k-a}\, a\,(n-a) + \frac{k-a}{b+k-a}\,(b+k)\,(n-b-k)$

Results:

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$-(-a\,b + b\,k + k^2 - k\,n)$

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$a\,b - k\,(b+k-n)$

$a\,b - b\,k - k^2 + k\,n$

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$$-\frac{a^2 b}{-a+b+k} - \frac{b^2 k}{-a+b+k} + \frac{a b^2}{-a+b+k} - \frac{k^3}{-a+b+k} + \frac{k^2 n}{-a+b+k} + \frac{a k^2}{-a+b+k} - \frac{2 b k^2}{-a+b+k} - \frac{a k n}{-a+b+k} + \frac{b k n}{-a+b+k} + \frac{2 a b k}{-a+b+k}$$

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QED.

$$\frac{b}{b+c}\, mA + \frac{c}{b+c}\, m\,ABC \leq k(n-k) + b(a-k).$$

Need to prove this combinatorially.

LERP

$x(n-x)$

$y(n-y)$

let $\alpha, \beta \in [0,1]$