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$$1. \quad \frac{f}{2}$$

• - ,

$$\operatorname{arctg} 1 = \frac{f}{4}. \quad -$$

$$, \quad \operatorname{arctg} \frac{1}{2} + \operatorname{arctg} \frac{1}{3} = \frac{f}{4}.$$

$$r = \operatorname{arctg} \frac{1}{2} \quad s = \operatorname{arctg} \frac{1}{3}, \quad :$$

$$\operatorname{tg}(r+s) = \frac{\operatorname{tgr} + \operatorname{tgs}}{1 - \operatorname{tgr} \cdot \operatorname{tgs}} = \frac{\frac{1}{2} + \frac{1}{3}}{1 - \frac{1}{2} \cdot \frac{1}{3}} = 1.$$

$$, \quad 0 < r, s < \frac{f}{4}, \quad 0 < r+s < \frac{f}{2},$$

$$r+s = \frac{f}{4}.$$

$$2. \quad : 3 \quad 6 \quad .$$

• x y . -

$$10 \cdot \left(\left[\frac{50}{x} \right] \right) . ,$$

$$x \quad 50, \quad ,$$

$$10 \cdot \left(\left[\frac{50}{x} \right] + 1 \right) . \quad 25$$

•

, , -

$$, \quad 20 \cdot \left(\left[\frac{50}{x} \right] \right)$$

$$20 \cdot \left(\left[\frac{50}{x} \right] + 1 \right) , \quad y \quad -$$

$$50. \quad 15$$

• , $x + y \leq 10$ -

$$195 \quad . \quad 10 \quad , \quad 195$$

$$x = 3 \quad y = 7 \qquad x = 4 \quad y = 6.$$

3. :

$$\sqrt{a+1+\sqrt{a}} - \sqrt{a+\sqrt{a+1}} \qquad a > 1 \qquad \sqrt{a+1} - \sqrt{a}$$

$$(\sqrt{a+1} - \sqrt{a})(\sqrt{a+1} + \sqrt{a}) = a+1 - a = 1,$$

$$\sqrt{a+1} - \sqrt{a} = \frac{1}{\sqrt{a+1} + \sqrt{a}} > \frac{1}{2\sqrt{a+1}}.$$

$$(\sqrt{a+1+\sqrt{a}} - \sqrt{a+\sqrt{a+1}})(\sqrt{a+1+\sqrt{a}} + \sqrt{a+\sqrt{a+1}}) = a+1+\sqrt{a} - a - \sqrt{a+1} < 1.$$

$$\sqrt{a+1+\sqrt{a}} - \sqrt{a+\sqrt{a+1}} < \frac{1}{\sqrt{a+1+\sqrt{a}} + \sqrt{a+\sqrt{a+1}}} < \frac{1}{2\sqrt{a+1}}.$$

$$\sqrt{a+1+\sqrt{a}} - \sqrt{a+\sqrt{a+1}} < \sqrt{a+1} - \sqrt{a},$$

= 2012

4. : 30° , 60° 90° .

AC H - F - AE, G -
 60 BC. L
 E. A
 K. , A G, AK - G, -
 [AB), K - ,
 AK. , [GH)
 [AB) GH = AK. EGH -
 LAK 60 ML -
 CEH, EH, KLM

KL. KL EH, 60 . ML
 , KLM .

5. .
 $C = A_1 A_2 \dots A_n A_1,$ -

, , , .
 $C = A_1 A_2 \dots A_n A_1,$.
 $A_n A_1$ -

A_1 , A_1 , -

« », - .
 $A_j -$, $j -$
 A_j , j n.
 $A_j A_{j-1}$. $A_j A_j -$
 $A_k -$. $A_j A_k$ $A_k A_{j-1}$ - .

$A_k A_{j-1} -$, $k = j-2$ $k=j+1$ $A_j A_k -$,
 $A_k A_{j-1} -$, $A_j A_k -$.

$A_{j-2} -$,
 $j.$, .
 $A_j A_{j-1}.$, -
 $A_j A_{j-1} A_{j+1}.$, -

, A_i A_j -
 A_i A_1 -
 A_1 $A_j.$, -