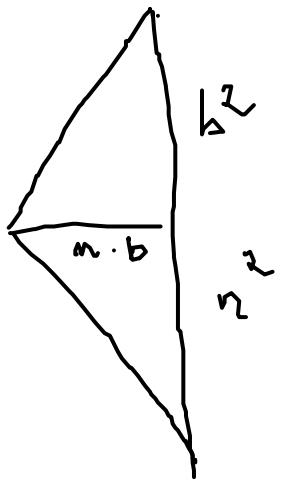
1



$$k = \frac{b}{b^2+h^2} \qquad S = \frac{n\cdot b\cdot(b^2+h^2)}{2}$$

$$S_{\triangle} = k^2\cdot S = \frac{b^2}{(b^2+h^2)^2}\cdot\frac{n\cdot b\cdot(b^2+h^2)}{2} = \frac{nb^3}{2(b^2+h^2)}$$

$$S_{\square} = n^2 - 2nb + 4S_{\triangle} = n^2 - 2nb + \frac{2nb^3}{b^2+h^2} = n(n-2b) + \frac{2nb^3}{b^2+h^2} =$$

$$= n\left[\frac{(n-2b)(b^2+h^2)+2b^3}{b^2+h^2}\right] = \frac{n}{b^2+h^2}\cdot\left(nb^2+n^3-2b^3-2bn^2+2b^3\right)$$

$$= \frac{n^2}{b^2+h^2}\left(n^2-2bn+b^2\right) = \frac{n^2(n-b)^2}{b^2+h^2}$$

$$p = \frac{S_{\square}}{n^2} = \frac{(n-b)^2}{n^2+b^2} = \frac{1}{2} \Rightarrow$$

$$2(n^2-2nb+b^2) = n^2+b^2$$

$$2n^2-4nb+2b^2 = n^2+b^2$$

$$n^2-4nb+b^2 = 0 \Rightarrow$$

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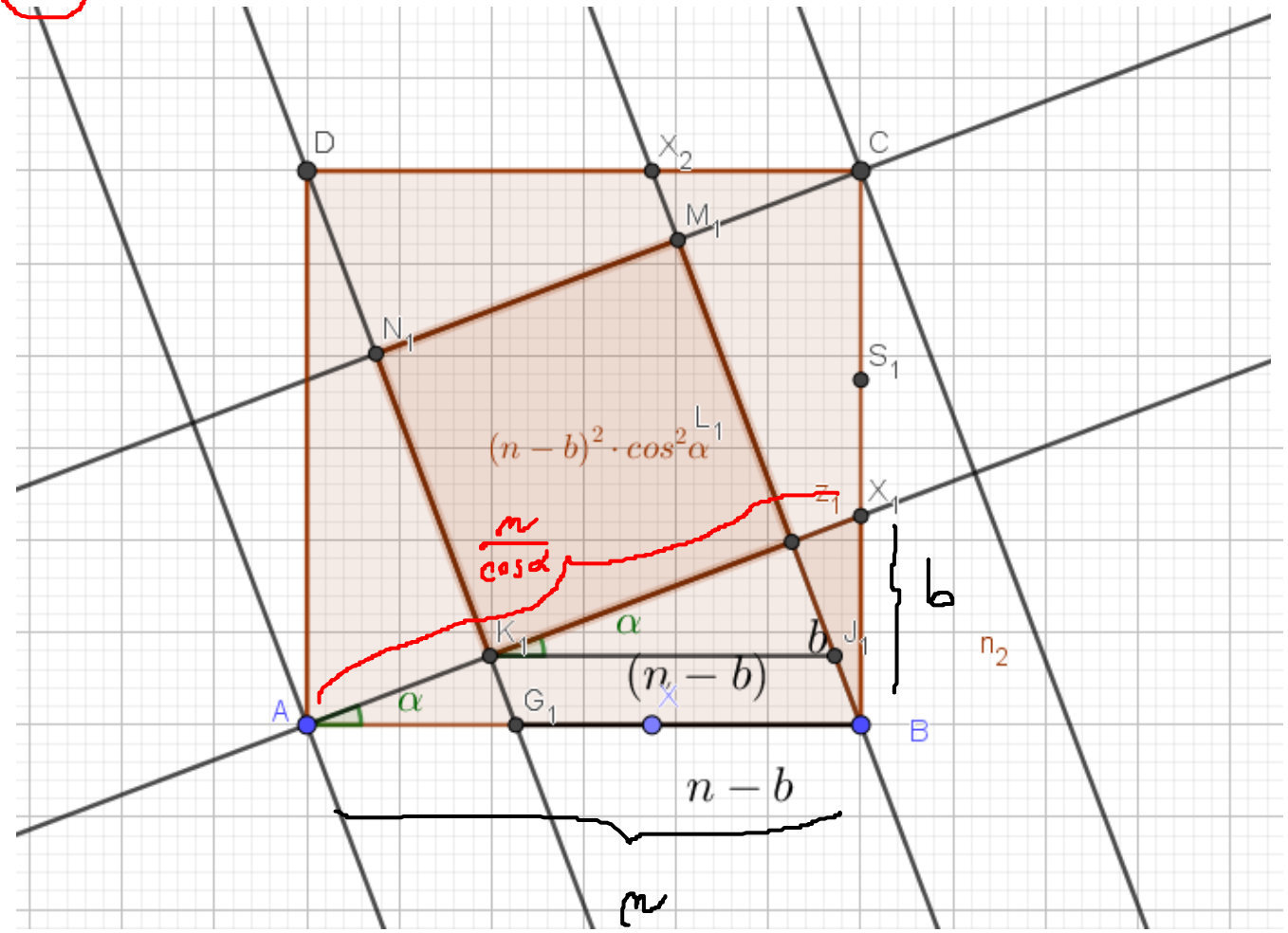
$$(n-2b)^2-3b^2=0$$

$$(n-2b+\sqrt{3}b)(n-2b-\sqrt{3}b)=0$$

$$n = b\cdot(2+\sqrt{3}) \Rightarrow \frac{b}{n} = \frac{1}{2+\sqrt{3}} =$$

$$= 2-\sqrt{3}$$

2)



$|K_1Z_1| = (n-b)\cdot\cos\alpha \Rightarrow$

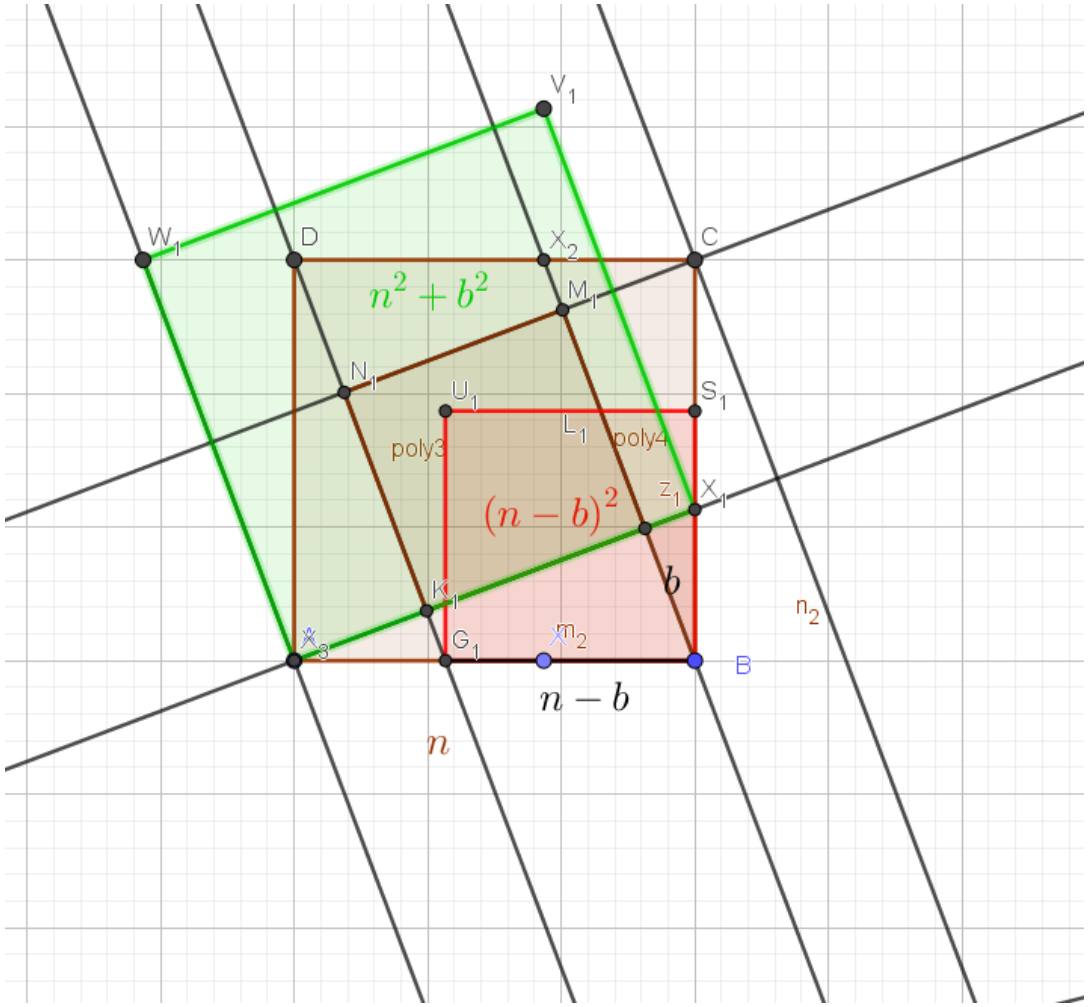
$$S_{k_1z_1n_1u_1} = (n-b)^2\cdot\cos^2\alpha$$

$$p = \frac{S_{k_1z_1n_1u_1}}{n^2} = \frac{(n-b)^2\cdot\cos^2\alpha}{n^2} = \frac{(n-b)^2}{\left(\frac{n^2}{\cos^2\alpha}\right)} = \frac{(n-b)^2}{|AX_1|^2}$$

PYTHAGORAS:

$$|AX_1|^2 = n^2 + b^2$$

$$\Rightarrow p = \frac{(n-b)^2}{n^2+b^2}$$



$$p = \frac{S_{K_1Z_1N_1M_1}}{S_{ABCD}} = \frac{S_{C_1B_1S_1U_1}}{S_{AK_1V_1W_1}} = \frac{(n-b)^2}{n^2+b^2}$$

pro $p = \frac{1}{2}$: $\frac{(n-b)^2}{n^2+b^2} = \frac{1}{2}$; $n > b$, $n, b \in \mathbb{R}^+$

$$2(n-b)^2 = n^2+b^2$$
$$2\cdot(n^2-2nb+b^2) = n^2+b^2$$
$$2n^2-4nb+2b^2 = n^2+b^2$$
$$n^2-4nb+b^2 = 0$$
$$(n^2-4nb+4b^2)-3b^2 = 0$$
$$(n-2b)^2-(\sqrt{3}b)^2 = 0$$
$$(n-2b+\sqrt{3}b)\cdot(n-2b-\sqrt{3}b) = 0$$

pro $n > b$: $n = 2b+\sqrt{3}b$
$n = b\cdot(2+\sqrt{3})$ $\Rightarrow$ $\frac{b}{n} = \frac{1}{2+\sqrt{3}} = \frac{2-\sqrt{3}}{4-3} = 2-\sqrt{3}$