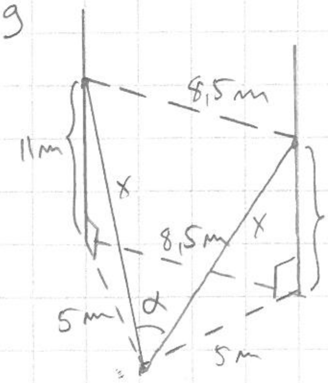
13.19



Pythagoras: $5^2+11^2=x^2$ $|\sqrt{\ }$

$\Leftrightarrow x=\sqrt{5^2+11^2}\approx 12{,}083$ (m)

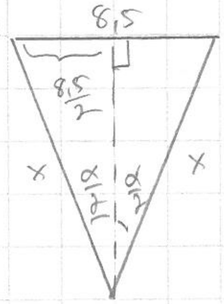
Kosinilause:

$8{,}5^2 = x^2+x^2-2\cdot x\cdot x\cdot\cos\alpha \quad | -2x^2$

$\Leftrightarrow 8{,}5^2-2x^2 = -2x^2\cos\alpha \quad | :(-2x^2)$

$\Leftrightarrow \cos\alpha = \dfrac{8{,}5^2-2x^2}{-2x^2} \Rightarrow \alpha \approx 41{,}1866^\circ \approx \underline{41^\circ}$

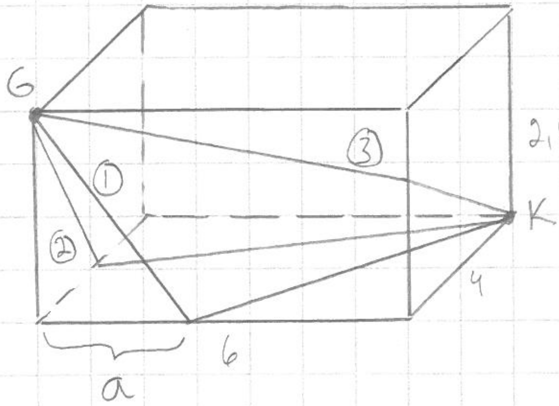
TAI:



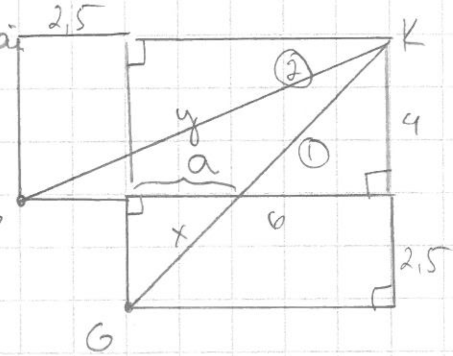
$\sin\dfrac{\alpha}{2} = \dfrac{\frac{8{,}5}{2}}{x} \Leftrightarrow \dfrac{\alpha}{2}\approx\ldots \Leftrightarrow \alpha\approx\ldots$

Esim. Kreetalaisen hotellihuoneen pituus 6,0 m, leveys 4,0 m ja korkeus 2,5 m. Huoneen ylänurkassa on gekkolisko ja vastakkaisessa alanurkassa maukas kärpänen. Laske gekon lyhin reitti kärpäsen kimppuun.

Ratk.



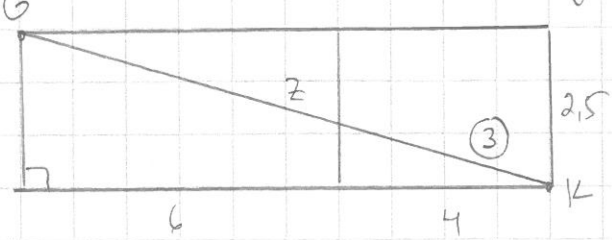
levitetään ⇒ tasoon



⇓

$x=\sqrt{6^2+(4+2{,}5)^2}\approx 8{,}85$ (m)

$y=\sqrt{(6+2{,}5)^2+4^2}\approx 9{,}39$ (m)



$z=\sqrt{(6+4)^2+2{,}5^2}\approx 10{,}31$ (m)

$\Delta\sim\Delta$ (kk) $\quad \dfrac{a}{2{,}5}=\dfrac{6}{4+2{,}5} \quad |\cdot 2{,}5$

$\Leftrightarrow a=\dfrac{6\cdot 2{,}5}{6{,}5}\approx 2{,}31$ (m)

Vast. Reitti ① kun $a\approx 2{,}31$ m, jolloin matka $x\approx 8{,}85$ m