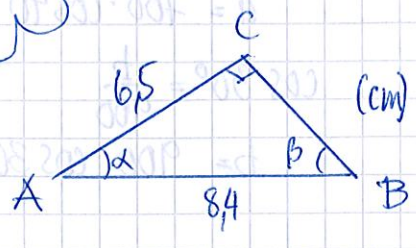
8 Kolmioharjoittelua

Sovella 3

S.23

69



$\measuredangle A = \alpha$

$\measuredangle B = \beta$

a) $\cos\alpha = \frac{6,5}{8,4}$

V: $\alpha \approx 39^\circ$

b) $\sin\beta = \frac{6,5}{8,4}$

V: $\beta \approx 51^\circ$

c) $\sin 39^\circ = \frac{BC}{8,4}$

$BC = 8,4 \cdot \sin 39^\circ$

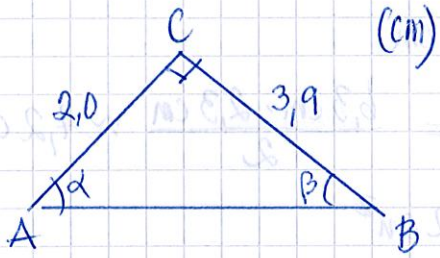
V: $BC \approx$ ~~6,5 cm~~ 5,3 cm

d) $A = \frac{b \cdot h}{2}$

$= \frac{6,5\text{ cm} \cdot 5,3\text{ cm}}{2} = \frac{34,45}{2}\text{ cm}^2$

V: $A = \frac{34\text{ cm}^2}{2} = 17\text{ cm}^2$

70



$\measuredangle A = \alpha$

$\measuredangle B = \beta$

a) $\tan\alpha = \frac{3,9}{2,0} = 1,95$

V: $\alpha = 63^\circ$

b) $\tan\beta = \frac{2,0}{3,9}$

V: $\beta \approx 27^\circ$

c) $\cos 63^\circ = \frac{2,0}{AB}$

$AB = \frac{2,0}{\cos 63^\circ}$

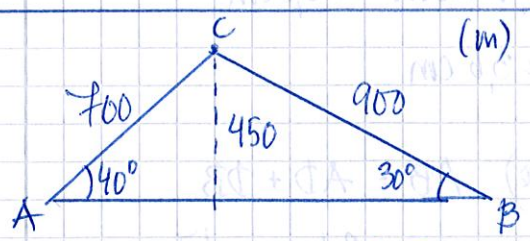
V: $AB \approx 4,4$ cm

d) $A = \frac{b \cdot h}{2}$

$= \frac{\cancel{2,0} \cdot 3,9}{\cancel{2}}\text{ cm}^2 = 3,9\text{ cm}^2$

V: $A = 3,9\text{ cm}^2$

71



a) $\sin 40^\circ = \frac{450}{AC}$

$AC = \frac{450}{\sin 40^\circ} \approx \underline{\underline{700\text{ m}}}$

b) $\sin 30^\circ = \frac{450}{BC}$

$BC = \frac{450}{\sin 30^\circ} = \underline{\underline{900\text{ m}}}$

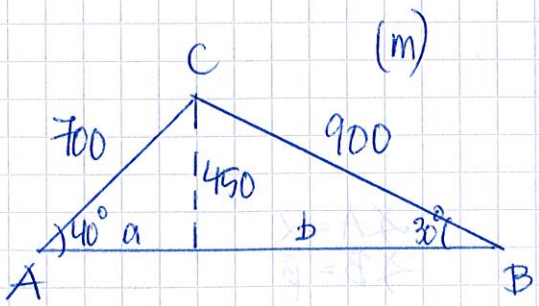
c) ~~$AB^2 = 700^2 + 900^2$~~

~~$AB = \sqrt{700^2 + 900^2} = \sqrt{490000 + 810000}$~~

~~$= \sqrt{1300000} \approx 1140$ m~~

Ei voidakaan koska ABC ei suorakulmainen

71 c)



$\cos 40° = \frac{a}{700}$

$a = 700 \cdot \cos 40°$

$\cos 30° = \frac{b}{900}$

$b = 900 \cdot \cos 30°$

$AB = a + b$

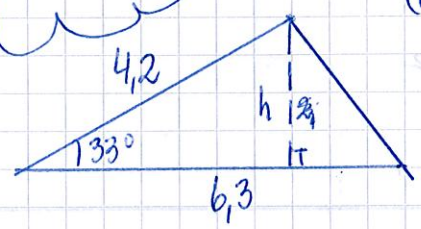
$= 700 \cdot \cos 40° + 900 \cdot \cos 30° \approx 536 + 779 \text{ m} \approx 1300 \text{ m}$

V: $AB \approx 1300 \text{m}$

SYVENNÄ

S.176

S40



a) korkeus h

$\sin 33° = \frac{h}{4,2}$

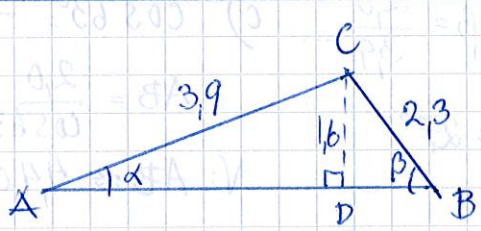
$h = 4,2 \cdot \sin 33° \text{ cm} \approx 2,3 \text{cm}$

V: $h \approx 2,3 \text{ cm}$

b) $A = \frac{b \cdot h}{2} = \frac{6,3 \text{ cm} \cdot 2,3 \text{ cm}}{2} \approx 7,2 \text{ cm}^2$

V: $A \approx 7,2 \text{ cm}^2$

S41



a) kulma $BAC = \alpha$

$\sin \alpha = \frac{1,6}{3,9}$

V: $\alpha \approx 24°$

b) kulma $CBA = \beta$

$\sin \beta = \frac{1,6}{2,3}$

V: $\beta \approx 44°$

c) $\cos 24° = \frac{AD}{3,9}$

$AD = 3,9 \cdot \cos 24° \approx 3,6 \text{cm}$

V: $AD \approx 3,6 \text{ cm}$

d) $\cos 44° = \frac{DB}{2,3}$

$DB = 2,3 \cdot \cos 44° \approx 1,7 \text{ cm}$

V: $DB \approx 1,7 \text{ cm}$

e) $AB = AD + DB$

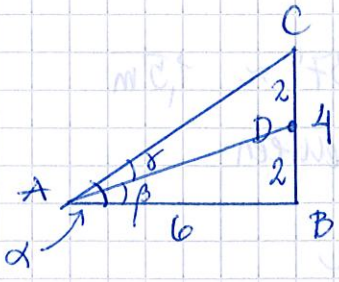
$= 3,6 \text{ cm} + 1,7 \text{ cm}$

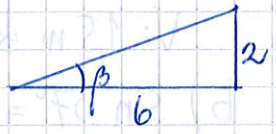
$= 5,3 \text{ cm}$ (likiarvo...)

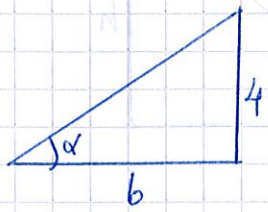
tai $AB = 3,9 \cdot \cos 24° + 2,3 \cdot \cos 44° \approx 5,2 \text{ cm}$

S.176 SYVENNÄ

S42







$\tan\beta = \frac{2}{6}$

$\beta \approx 18{,}43^\circ$

$\approx 18^\circ$

$\tan\alpha = \frac{4}{6}$

$\alpha \approx 33{,}69^\circ$

$\gamma = \alpha - \beta$

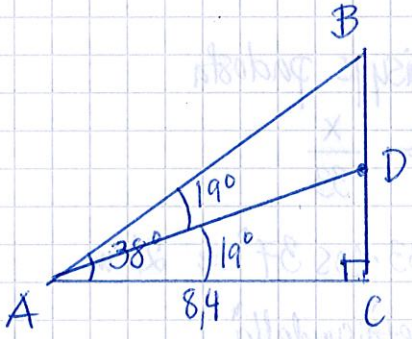
$= 33{,}69^\circ - 18{,}43^\circ$

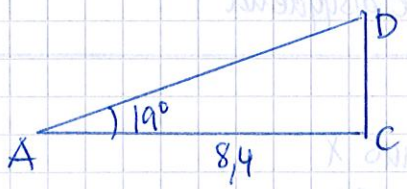
$= 15{,}26^\circ$

$\approx 15^\circ$

V: $\beta \approx 18^\circ$ ja $\gamma \approx 15^\circ$

S43





a) $\tan 38^\circ = \frac{BC}{8{,}4}$

$BC = 8{,}4 \cdot \tan 38^\circ \approx 6{,}6$ cm

V: $BC \approx 6{,}6$ cm

b) $\tan 19^\circ = \frac{DC}{8{,}4}$

$DC = 8{,}4 \cdot \tan 19^\circ \approx 2{,}9$ cm

V: $DC \approx 2{,}9$ cm

c) $BD = BC - DC$

$= 8{,}4 \cdot \tan 38^\circ - 8{,}4 \cdot \tan 19^\circ$

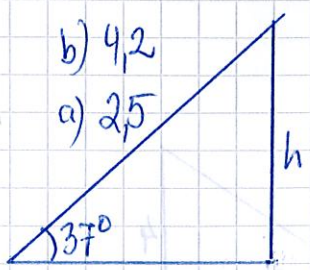
$= 8{,}4\,(\tan 38^\circ - \tan 19^\circ)$

$\approx 3{,}7$ cm

V: $BD \approx 3{,}7$ cm

S.176

S44



a) $\sin 37° = \frac{h}{2,5}$

$h = 2,5 \cdot \sin 37° \approx 1,5\,m$

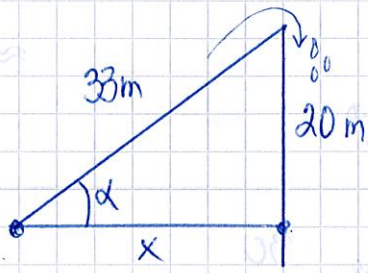
V: 1,5 m korkeuteen

b) $\sin 37° = \frac{h}{4,2}$

$h = 4,2 \cdot \sin 37° \approx 2,5\,m$

V: 2,5 m korkeuteen

S45



a) $\sin\alpha = \frac{20}{33}$

V: $\alpha \approx 37°$

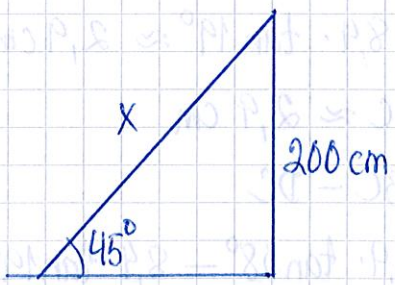
b) x etäisyys padosta

$\cos 37° = \frac{x}{33}$

$x = 33 \cdot \cos 37° \approx 26\,m$

V: 26 m etäisyydellä

S46



Ruuvin pituus x

$\sin 45° = \frac{200\,cm}{x}$

$x = \frac{200\,cm}{\sin 45°} = \left(\frac{200}{\sqrt{2}}\right) \approx 280\,cm$

V: 280 cm pitkä