

Underveis eksamen:

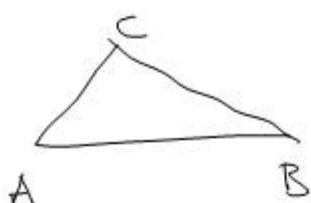
tirsdag 16. desember

Geometri (kap. 9)

- trekant (9.4-9.6)
- sirkler
- volum/overflate av tredim. figurer

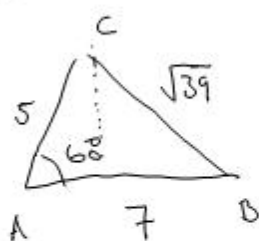
Trekant

① Cosinussetningen



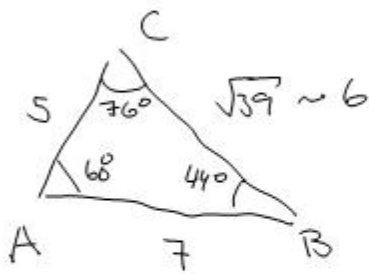
$$BC^2 = AB^2 + AC^2 - 2 \cdot AB \cdot AC \cdot \cos(A)$$

Eksempel:



$$\begin{aligned} BC^2 &= 5^2 + 7^2 - 2 \cdot 5 \cdot 7 \cdot \cos(60^\circ) \\ &= 25 + 49 - 70 \cdot \frac{1}{2} = 39 \end{aligned}$$

$$BC = \sqrt{39} \approx \underline{6}$$



$$\angle C = 180^\circ - 60^\circ - 44^\circ$$

$$\approx \underline{76^\circ}$$

$$AC^2 = AB^2 + BC^2 - 2 \cdot AB \cdot BC \cdot \cos(B)$$

$$5^2 = 7^2 + (\sqrt{39})^2 - 2 \cdot 7 \cdot \sqrt{39} \cdot \cos B$$

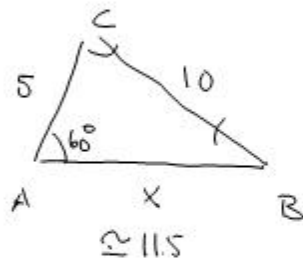
$$25 = 88 - 14\sqrt{39} \cdot \cos B$$

$$\frac{25 - 88}{-14\sqrt{39}} = \cos B$$

$$\cos B \approx 0.72$$

$$B \approx \underline{\underline{44^\circ}}$$

Eks:



$$BC^2 = AB^2 + AC^2 - 2 \cdot AB \cdot AC \cdot \cos A$$

$$100 = x^2 + 25 - 10x \cdot \frac{1}{2}$$

$$100 = x^2 + 25 - 5x$$

$$0 = x^2 - 5x - 75$$

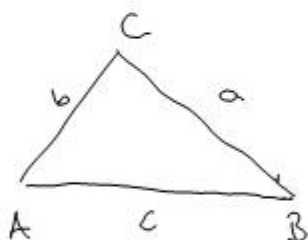
$$x = \frac{5 \pm \sqrt{25 - 4 \cdot (-75)}}{2} = \frac{5 \pm \sqrt{325}}{2}$$

$$= \frac{5 \pm \sqrt{25 \cdot 13}}{2} = \frac{5 \pm 5\sqrt{13}}{2}$$

$$= \frac{5 + 5\sqrt{13}}{2} \approx \underline{\underline{11.5}}$$

(2) Sinusettingen

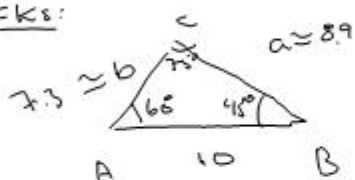
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$



Tre likninger:

$$\frac{a}{\sin A} = \frac{b}{\sin B}, \quad \frac{b}{\sin B} = \frac{c}{\sin C}, \quad \frac{a}{\sin A} = \frac{c}{\sin C}$$

Eks:



$$AB = 10$$

$$\angle A = 60^\circ$$

$$\angle B = 45^\circ$$

$$\angle C = 75^\circ$$

$$\underline{AC = b}: \quad \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{b}{\sin 45^\circ} = \frac{10}{\sin 75^\circ}$$

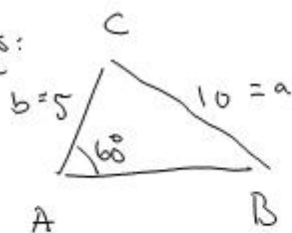
$$b = \frac{10 \cdot \sin 45^\circ}{\sin 75^\circ} \approx \underline{7.3}$$

$$\underline{BC = a}: \quad \frac{a}{\sin A} = \frac{c}{\sin C}$$

$$\frac{a}{\sin 60^\circ} = \frac{10}{\sin 75^\circ}$$

$$a = \frac{10 \cdot \sin 60^\circ}{\sin 75^\circ} \approx \underline{8.9}$$

Eks:



$$\frac{a}{\sin A} = \frac{10}{\sin 60^\circ} = \frac{10}{\sqrt{3}/2} = \frac{20}{\sqrt{3}}$$

$$\frac{b}{\sin B} = \frac{a}{\sin A}$$

$$\frac{5}{\sin B} = \frac{20}{\sqrt{3}} \quad | \cdot \sin B$$

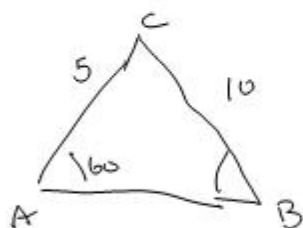
$$5 = \frac{20 \cdot \sin B}{\sqrt{3}} \quad | \cdot \frac{\sqrt{3}}{20}$$

$$\frac{5\sqrt{3}}{20} = \sin B \quad \Leftrightarrow \sin B = \frac{\sqrt{3}}{4}$$

$$B \approx \underline{26^\circ} \quad \text{eller} \quad B \approx 180^\circ - 26^\circ = \underline{154^\circ}$$

Brak sinus setninger!

f.t.s:



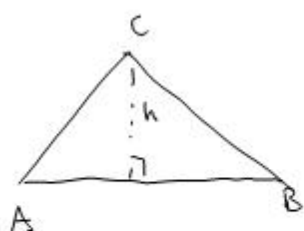
$$\angle B \approx \underline{26^\circ}$$

eller ~~$\angle B \approx 154^\circ$~~

fordi $\angle A = 60^\circ$

$$\Rightarrow \angle B = \underline{\underline{26^\circ}}$$

③ Arealsetningen:



$$\begin{aligned} h &= AC \cdot \sin A \\ &= \underline{AC \cdot \sin A} \end{aligned}$$

fordi

$$\sin A = \frac{h}{AC}$$

$$\text{Areal} = \frac{\text{grunnlinje} \cdot \text{høyde}}{2}$$

$$= \frac{AB \cdot h}{2}$$

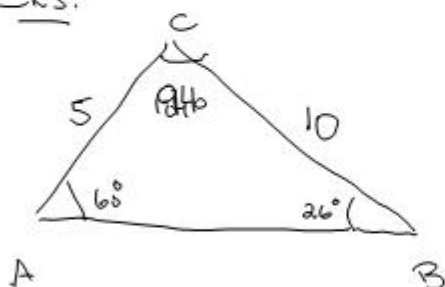
$$= \frac{AB \cdot AC \cdot \sin A}{2}$$

$$\text{Areal} = \frac{1}{2} \cdot AB \cdot AC \cdot \sin A$$

$$= \frac{1}{2} \cdot AB \cdot BC \cdot \sin B$$

$$= \frac{1}{2} \cdot AC \cdot BC \cdot \sin C$$

Eks:

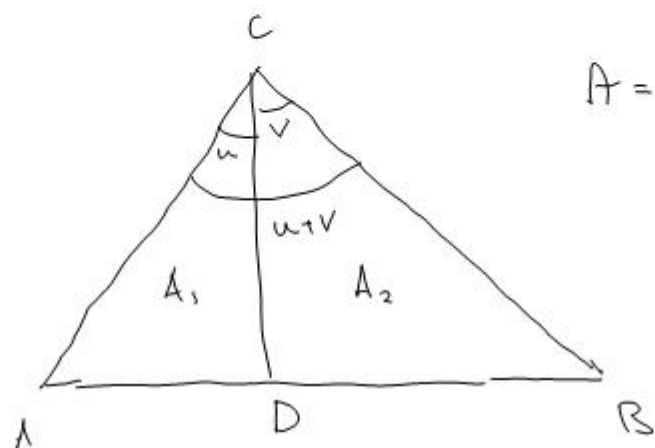


$$\text{Areal} = \frac{1}{2} \cdot 5 \cdot 10 \cdot \sin 60^\circ$$

$$\approx 21.9$$

21.9

Ex: $\sin(u+v) = ?$



$$A = A_1 + A_2$$

$$A = \frac{1}{2} \cdot AC \cdot BC \cdot \sin(u+v)$$

$$A = A_1 + A_2 = \frac{1}{2} \cdot AD \cdot CD + \frac{1}{2} \cdot \overset{BD}{\cancel{BC}} \cdot CD$$

$$= \frac{1}{2} \cdot AC \cdot CD \cdot \sin(u) + \frac{1}{2} \cdot BC \cdot CD \cdot \sin(v)$$