

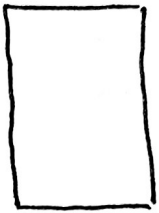
Kap 9

9.1 - 9.3 og 10.6

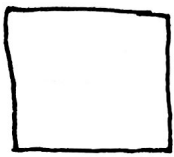
21sep
2021

①

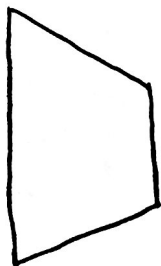
Rektangel



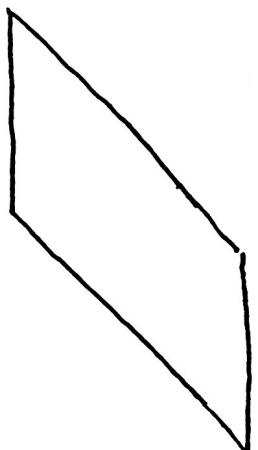
kvadrat



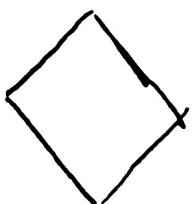
trapes



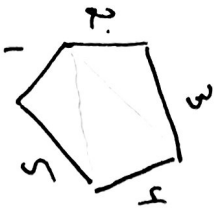
Parallelogram



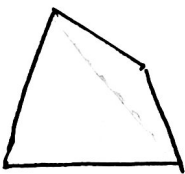
Rombe



Notsatte sider
er parallelle
Alle sider
er like lange



5-kannt



Firkannt

Trekant



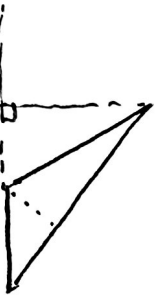
like sider



like sider



Rektvinkeltrekant



Kongruens



"same trekant"
forflyttet

Formlikhet



= samme form
men i forskjellig
skala (størrelse)

②



ett omkøp = 360° grader



halvt omkøp = 180°



Rett vinkel
Kvart omkøp = 90°



Radianer:

$$2\pi \text{ rad} = 360^\circ \text{ (deg)}$$

$$\pi \text{ rad} = 180^\circ$$

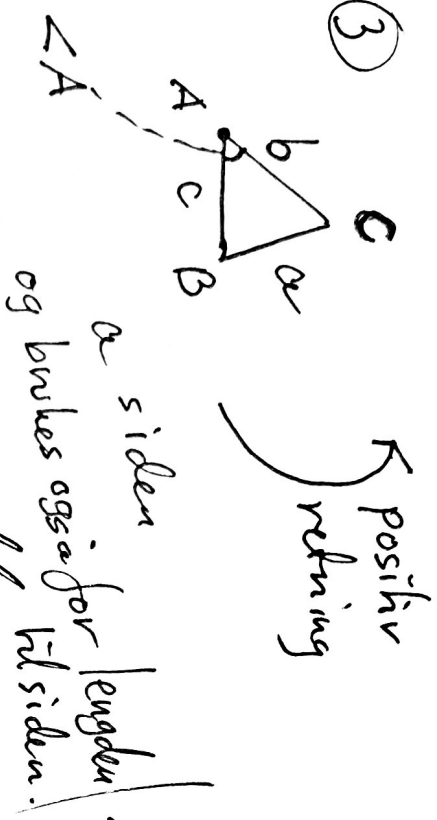
$$\frac{\pi}{2} \text{ rad} = 90^\circ$$

└─ rett vinkel

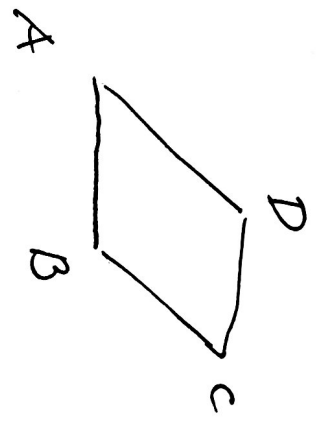
△
spiss vinkel

▷
stump vinkel.

③



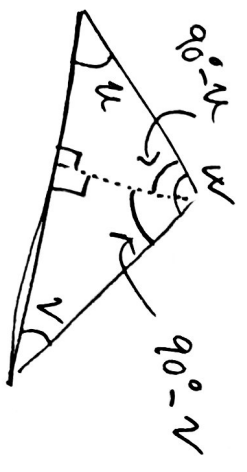
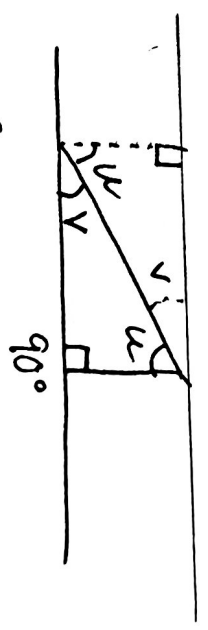
a siden og brukes også for lengden til siden.



Summen av vinklene i en trekant er 180°

$$u + v + 90^\circ = 180^\circ$$

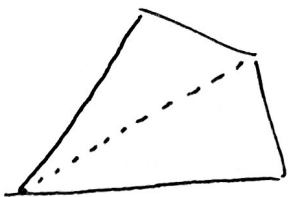
Så $u + v = 90^\circ$



Så $u + v = 180^\circ$

Så $u + v + u = 180^\circ$

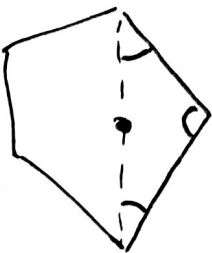
Så $u + v = 180^\circ - u - v$



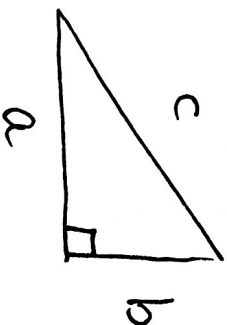
Summen
av vinkelen
i en firkanter
er $180^\circ + 180^\circ = 360^\circ$

Summen av
vinklene i en
 n -kant er:
 $(n-2) \cdot 180^\circ$

(4)

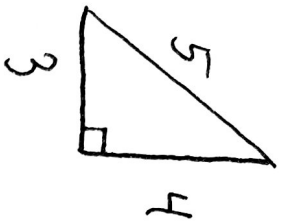


Pytagoras sin sats.

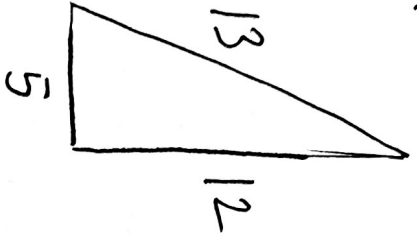


$$c^2 = a^2 + b^2$$

a, b kateter (hosliggende til
den rette vinkel)
 c hypotenus
(motstående
til den rette vinkel)



$$3^2 + 4^2 = 9 + 16 = 25 = 5^2$$



$$5^2 + 12^2 = 25 + 144 = 169$$

$$(160 + 40 + 9)$$

$$5^2 + 12^2 = 13^2$$

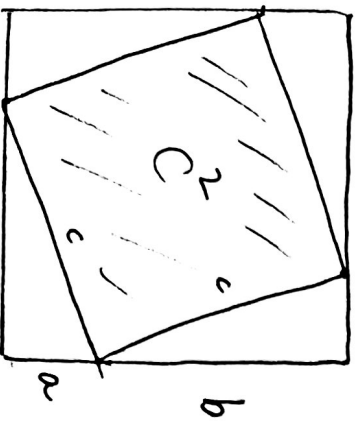
(5)



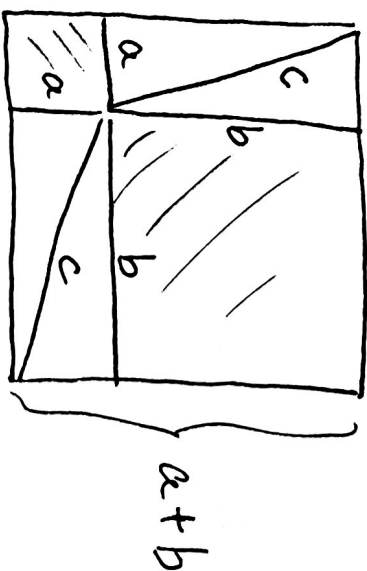
$$1^2 + 1^2 = c^2$$

$$2 = c^2$$

$$c = \sqrt{2}$$



$$S_{\text{a}} \\ \underline{c^2 = a^2 + b^2}$$



$$\text{Area of } (a+b)^2$$

$$= a^2 + b^2$$

$$+ 2a \cdot b$$

9.2

Sinus og Cosinus (trigonometriske funktioner)

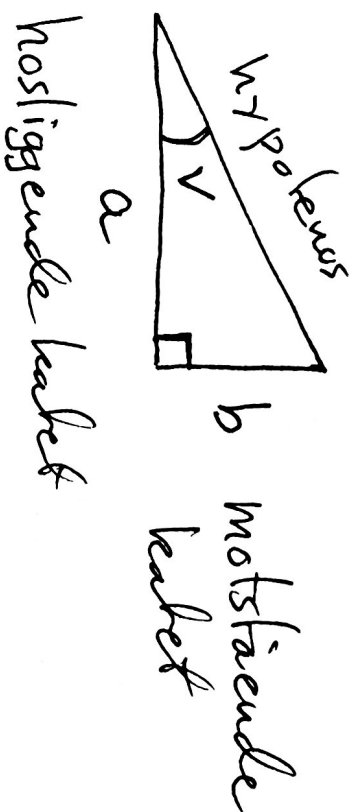
Sin cos

⑥

$$\sin(V) = \frac{\text{modstående katet}}{\text{hypotenüs}}$$

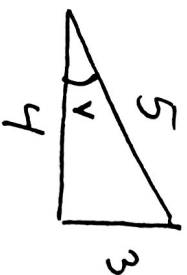
$$\cos(V) = \frac{\text{hosliggende katet}}{\text{hypotenüs}}$$

$$0^\circ < V < 90^\circ$$



$$\cos(0^\circ) = 1 ; \sin(0^\circ) = 0$$

$$\cos(90^\circ) = 0 , \sin(90^\circ) = 1$$



$$\sin(V) = \frac{3}{5} = \underline{0.6}$$

$$\cos(V) = \frac{4}{5} = \underline{0.8}$$

$$V = \arcsin(0.6) = 36.869...^\circ$$

$$= \arccos(0.8)$$

9.3 invers trigonometriske funksjon

⑦

$\sin^{-1}(x)$ gir vinkel $\angle$ slik at $\sin(\angle) = x$.

$$0 \leq x \leq 1$$

invers sinusfunksjonen.

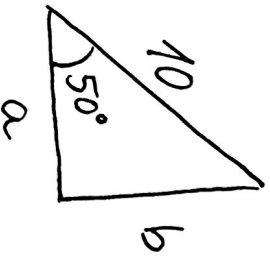
$$\sin^{-1}(x) = \arcsin(x) = \text{arcsinus}$$

$$\boxed{\sin}^{\sin^{-1}}$$

$$(\sin^{-1}(x)) \neq (\sin x)^{-1}$$

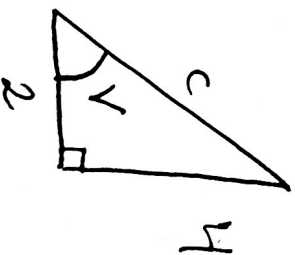
$$\begin{aligned} \text{Tilsvarende} & \arccos(x) \\ &= \cos^{-1}(x) \end{aligned}$$

Oppg



Finne a og b

$$\begin{aligned} b &= 7.66 \\ a &= 6.43 \end{aligned}$$



Finne $\angle V$ og c .

$$\begin{aligned} c & \text{ ved Pythagoras} \\ c^2 &= 2^2 + 4^2 = 20 \end{aligned}$$

$$c = \frac{2\sqrt{5}}{1}$$

$$\cos V = \frac{2}{c} = \frac{2}{2\sqrt{5}} = \frac{1}{\sqrt{5}}$$

$$\begin{aligned} V &= \arccos\left(\frac{1}{\sqrt{5}}\right) \\ &= 63.4349^\circ \end{aligned}$$

10.6

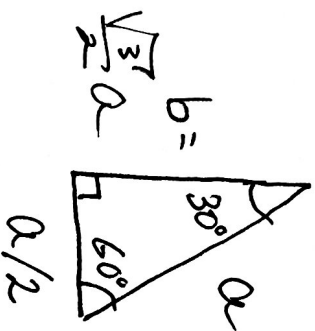
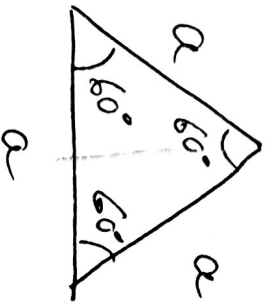
Etiske verdier til $\sin(V)$ og $\cos(V)$

⑧



$$\cos(45^\circ) = \frac{1}{\sqrt{2}}$$

$$\sin(45^\circ) = \frac{1}{\sqrt{2}} \approx 0.707$$



Pytagoras

$$a^2 = \left(\frac{a}{2}\right)^2 + b^2$$

$$b^2 = \frac{4a^2}{4} - \frac{a^2}{4}$$

$$= \frac{3a^2}{4}$$

$$b = \sqrt{\frac{3}{4}} a$$

$$(20)$$

$$\cos(60^\circ) = \sin(30^\circ) = \frac{a/2}{a} = \frac{1}{2}$$

$$\sin(60^\circ) = \cos(30^\circ) = \frac{(\sqrt{3}/2)a}{a} = \frac{\sqrt{3}}{2} \approx 0.866$$

$= \frac{\sqrt{3}}{2} a$
Vi kan bruke kjende verdier til å estimere.

Finn V slik at

$$\sin(V) = 0.9$$

($V \sim 64.15^\circ$)

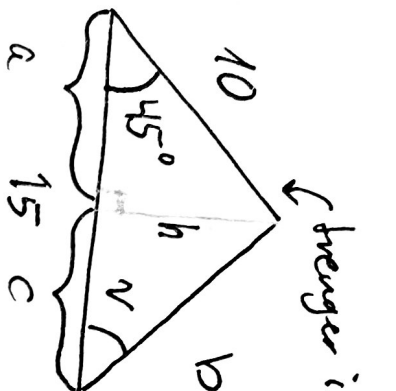
$$\sin(V) = \frac{3}{4} = 0.75$$

($V \sim 48.59^\circ$)

$V > 60^\circ$
 $V \sim 50^\circ$?

oppg.

9



↑ trenger ikke være 90°
~~Finn~~ lengden b
 og vinkelene v.

$$h = 10 \cdot \sin(45^\circ) = 10 \cdot \frac{1}{\sqrt{2}} = 10 \cdot \frac{\sqrt{2}}{2} = 5\sqrt{2} \sim 7.07$$

$$c = 15 - a = 15 - 5\sqrt{2} \sim 7.93$$

(Forventer
 b litt større enn 10
 v litt mindre
 enn 45°)

$$a = 10 \cdot \cos(45^\circ) = 5\sqrt{2}$$

$$\text{Pythagoras} \quad b^2 = h^2 + c^2$$

$$= (5\sqrt{2})^2 + (5(3 - \sqrt{2}))^2$$

$$= 5^2(2 + (3 - \sqrt{2})^2) = 5^2(2 + 9 + 2 - 6\sqrt{2})$$

$$b = \sqrt{5 \sqrt{13 - 6\sqrt{2}}} \sim 10.6239 \dots \sim 10.624$$

$$\sin v = \frac{h}{b}$$

$$v = \arcsin\left(\frac{h}{b}\right) = 41.727^\circ$$

$$3. \text{ vinkelene } \text{er } 180^\circ - v - 45^\circ = 93.273$$