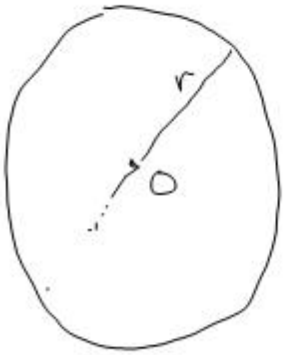
Geometri

Sirkler (97-99)



Sirkelen med senter O og radius r.

= alle punkt med avstand r til O.

$d = 2r$
diameter

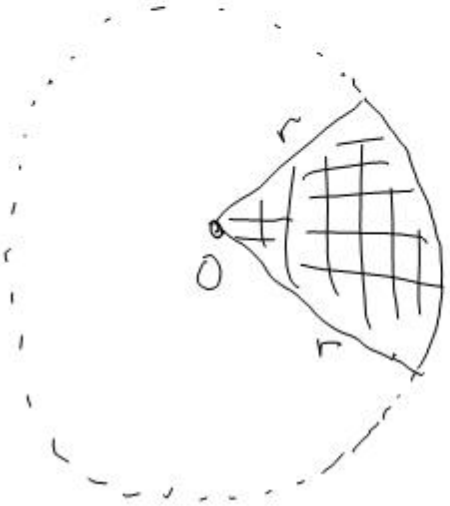
Areal =	πr^2	
Omkrets =	$2\pi r$	$= \pi \cdot d$

Defn. av π:

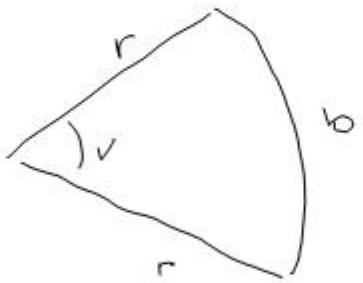
$\pi = O/d$

O = omkrets
d = diameter

Sirkelsektor



Sirkelsektor = den delen av en sirkel som er begrenset av to radier



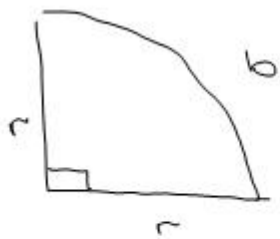
b = buelengde

$= 2\pi r \frac{v}{360^\circ}$ (v er målt i grader)

A = areal

$= \pi r^2 \cdot \frac{v}{360^\circ}$ (-11-)

Eks:

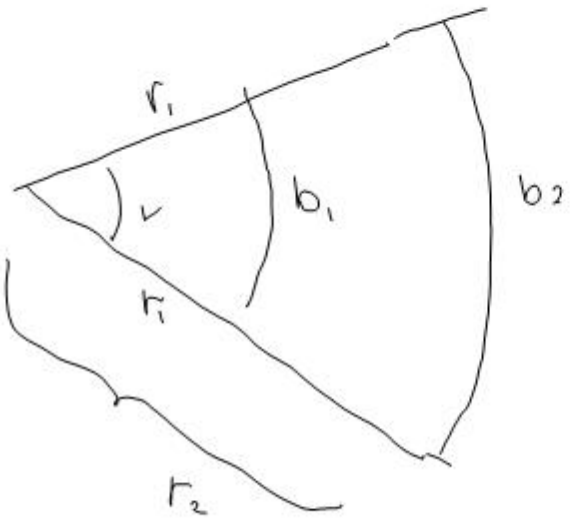


$b = \frac{2\pi r}{4} = \frac{\pi r}{2}$

$\frac{90^\circ}{360^\circ} = \frac{1}{4}$

$A = \frac{\pi r^2}{4}$

Absolutt vinkelmål



$$\frac{b_1}{r_1} = \frac{b_2}{r_2}$$

Defn:

$$v = \frac{b}{r}$$ vinkelen i radianer

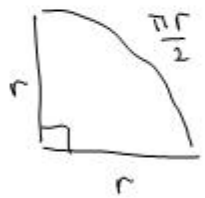
$$b = 2\pi r \cdot \frac{v}{360^\circ}$$
$$A = \pi r^2 \cdot \frac{v}{360^\circ}$$

} v er målt i grader

$$b = 2\pi r \cdot \frac{v}{2\pi} = r \cdot v$$
$$A = \pi r^2 \cdot \frac{v}{2\pi} = \frac{1}{2} r^2 \cdot v$$

} v er målt i radianer

Eks:

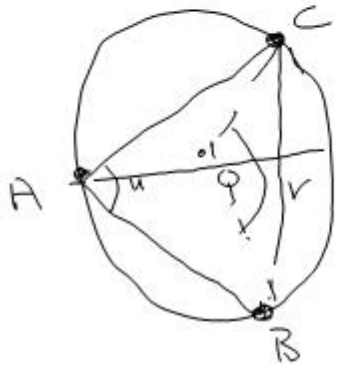


$$b = \frac{2\pi r}{4} = \frac{\pi r}{2}$$

$$\frac{b}{r} = \frac{\pi r/2}{r} = \frac{\pi r}{2r} = \frac{\pi}{2}$$

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

Periferivinkel og sentralvinkel

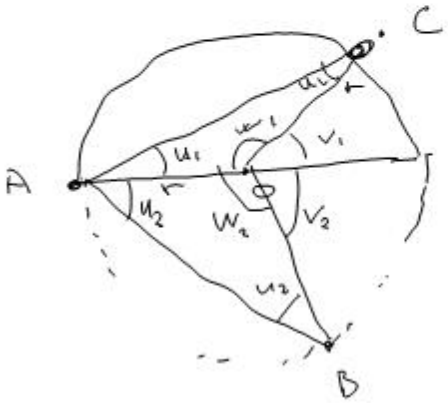


u : periferivinkel

v : sentralvinkelen

Resultat: $\boxed{v = 2u}$

Vinkel $v_1 = 2u_1$:



$$\left.\begin{aligned} w_1 &= 180^\circ - v_1 \\ &= 180^\circ - 2u_1 \end{aligned}\right\} \; v_1 = 2u_1$$

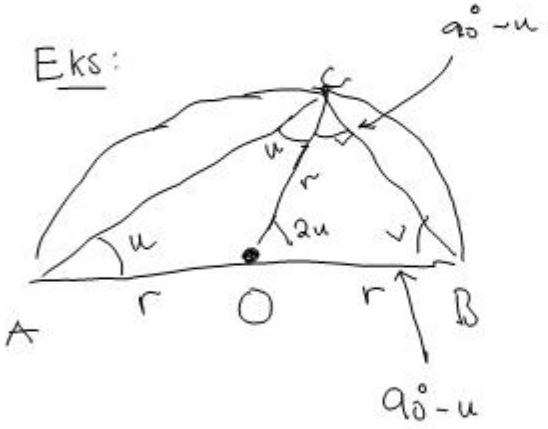
$$\left.\begin{aligned} w_2 &= 180^\circ - v_2 \\ &= 180^\circ - 2u_2 \end{aligned}\right\} \; v_2 = 2u_2$$

$$\left.\begin{aligned} u &= u_1 + u_2 \\ v &= v_1 + v_2 \end{aligned}\right\}$$

$$\begin{aligned} v &= v_1 + v_2 = 2u_1 + 2u_2 \\ &= 2 \cdot (u_1 + u_2) = 2u \end{aligned}$$

Så $v = 2u$

Eks:



$\angle B = \angle OBC = \angle OCB$

$2u + v + v = 180^\circ$

$2u + 2v = 180^\circ$

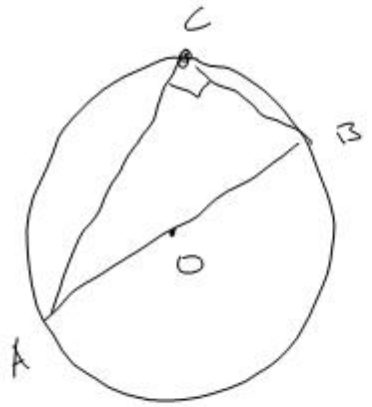
$\frac{2v}{2} = \frac{180^\circ - 2u}{2}$

$v = \underline{90^\circ - u}$

$\angle C = \angle ACB = u + v$

$= u + 90^\circ - u = \underline{\underline{90^\circ}}$

Konklusjon:



Hvis AB er diameteren i en sirkel og C ligger på samme sirkel, så er $\underline{\angle C = 90^\circ}$.

Volum og overflate

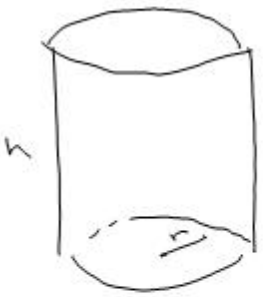
av noen tredimensjonale figurer

(kap. 9.1 - 9.2)

(kap 9.3 kommer etter jul)

Prismer.

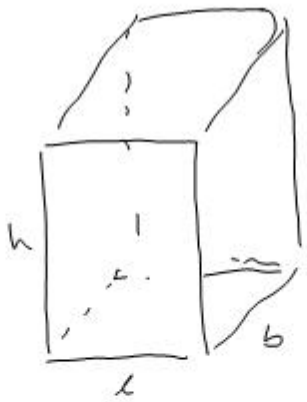
Def.: Toppflaten og bunnflaten er like.



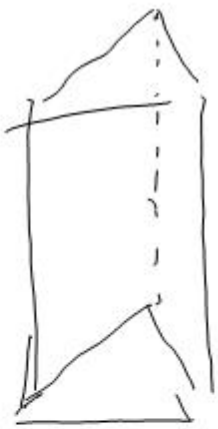
Rett sylinder er eksempel på prisme

skjev sylinder

rett sylinder



rett rektangulært prisme



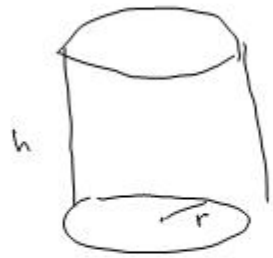
rett trekantet prisme

Volum av prismer:

$$V = \text{grunnflate} \cdot \text{høyde}$$

$$V = G \cdot h$$

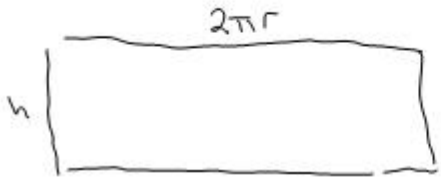
Sylinder:



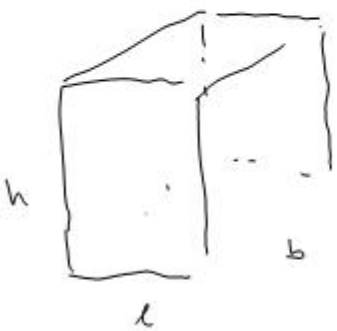
$$V = \pi r^2 \cdot h$$

$$O = \pi r^2 + \pi r^2 + 2\pi r \cdot h$$

$$= 2\pi r^2 + 2\pi rh$$

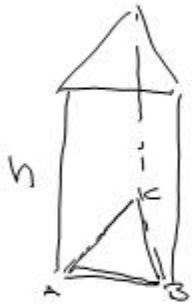


Rektangulært prisme



$$V = l \cdot b \cdot h$$

$$O = 2lb + 2lh + 2bh$$

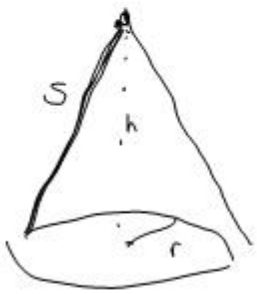


Trekantet prisme

$V = \text{Areal}(\Delta ABC) \cdot h$

$O = 2 \cdot \text{Areal}(\Delta ABC) + \underbrace{AB \cdot h + AC \cdot h + BC \cdot h}_{(\text{omkrets av } \Delta ABC) \cdot h}$

Pyramider. { pkt i stedet for en topplate



kjegle

rektangulær pyramide

trekantet pyramide

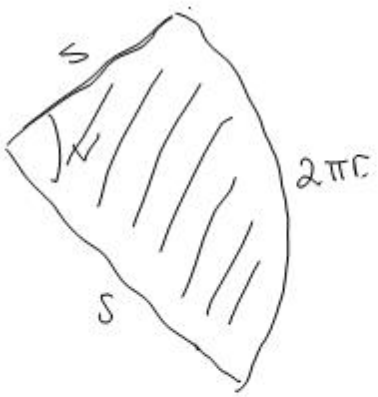
$$\boxed{V = \frac{1}{3} \cdot \text{Grunnflate} \cdot \text{høyde}}$$

Kjegle:

$s = \sqrt{h^2 + r^2}$

$V = \frac{1}{3} \cdot \pi r^2 \cdot h$

$O = \pi r^2 + \pi r s$

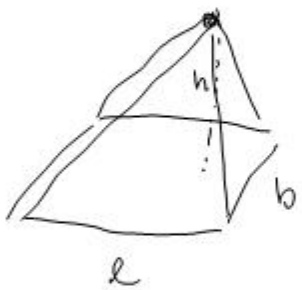


$A = \frac{1}{2} s^2 \cdot v$

$= \frac{1}{2} s^2 \cdot \frac{2\pi r}{s}$

$= \frac{s^{\cancel{2}} \cdot \cancel{2}\pi r}{\cancel{2} \cdot \cancel{s}} = \pi r s$

Rektangulær pyramiden:



$V = \frac{1}{3} \cdot lb \cdot h$

$O = l \cdot b +$ Summen av arealet av fire trekanter.

Kulen:

Kule med radius r.

$$V = \frac{4}{3}\pi r^3$$

$$O = 4\pi r^2$$

Halv kule med radius r.

$$V = \frac{2}{3}\pi r^3$$

$$O = 2\pi r^2 \quad (+\pi r^2)$$

↑ grunnflate.