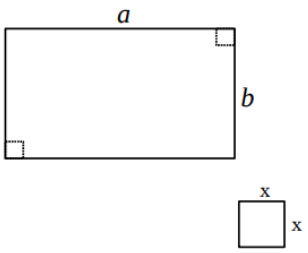
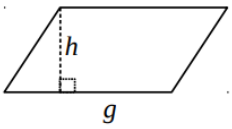
Horna- og rúmfræði formúlublað — Tvívíð og þrívíð form



RÉTTHYRNINGUR
Ferhyrningur með öll horn rétt, gagnstæðar hliðar jafn langar.

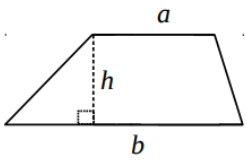
$F = a \cdot b$
$U = 2a + 2b$ *(þ.e. summa allra hliðarlengda).*

FERNINGUR er rétthyrningur með allar hliðar jafn langar.



SAMSÍÐUNUGR
Ferhyrningur með gagnstæðar hliðar jafn langar og gagnstæð horn jafn stór.

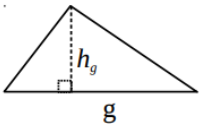
$F = g \cdot h$
U = summa allra hliðarlengda.



TRAPISA
Ferhyrningur með tvær gagnstæðar hliðar samsíða en hinar ekki.

$F = \frac{a+b}{2} \cdot h$ (a || b)

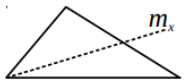
U = summa allra hliðarlengda.



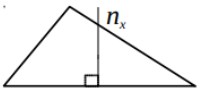
ÞRÍHYRNINGUR
Flatarmál þríhyrnings finns með því að margfalda sama lengd einnar hliðar (grunnlínu) og hæðina á þá hlið.

$F = \frac{g \cdot h}{2}$
U = summa allra hliðarlengda.

helmingalína horns

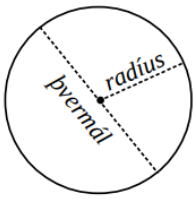


miðlína á hlið



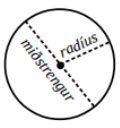
miðþverill

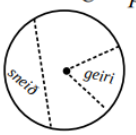
$\text{Sin}(A°) = \frac{mótl.}{langhl.}$ $\text{Cos}(A°) = \frac{aðl.}{langhl.}$ $\text{Tan}(A°) = \frac{mótl.}{aðl.}$

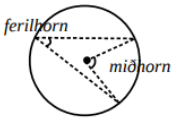


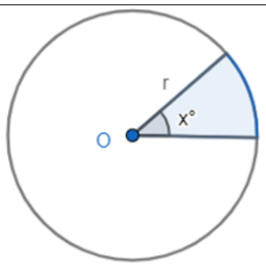
HRINGUR
Hlutfallið milli ummáls og þvermáls hrings kallast „pí“.
π = 3.14159265359...

$F = r^2 \cdot \pi$ $U = þ \cdot \pi$









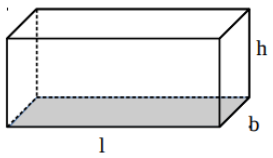
Flatarmál geira: $F = \frac{\pi \cdot r^2}{360°} \cdot x°$

Ummál geira: $U = \frac{2 \cdot \pi \cdot r}{360°} \cdot x° + 2 \cdot r$

Horna- og rúmfræði formúlublað

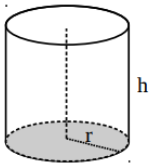
Tvívíð og þrívíð form

V merkir rúmmál
Y merkir yfirborðsflatarmál
B merkir flatarmál botnflatar



FERSTRENDINGUR (kassi)

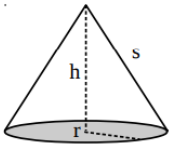
$V = B \cdot h$ *(sem er* $l \cdot b \cdot h$*)*
Y = summa flatarmáls allra hliða.



SÍVALNINGUR

$V = r^2 \cdot \pi \cdot h$ *(flatarmál botflatar margf. með hæð)*

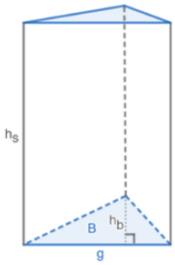
$Y = (þ \cdot \pi \cdot h) + 2(r^2 \cdot \pi)$ *(summa möttuls og enda)*
(ummál botnflatar margf. með hæð) + (tveir hringfletir)



KEILA

$V = \frac{r^2 \cdot \pi \cdot h}{3}$ *(þriðjungur úr sívalningi)*

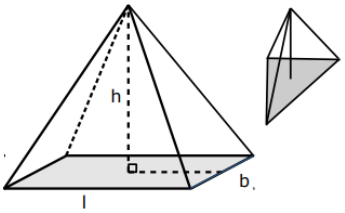
$Y = (r^2 \cdot \pi) + (r \cdot \pi \cdot s)$ *(summa botns og möttuls)*



Þrístrendingur

Botnflötur: $B = \frac{g \cdot h_b}{2}$

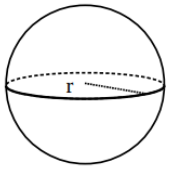
Rúmmál: $V = \frac{g \cdot h_b}{2} \cdot h_s$



PÝRAMÍDI

$V = \frac{B \cdot h}{3}$ *(B er flatarmál grunnflatar)*

Y = B + flatarmál allra þríhyrndra hliða



KÚLA

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

$Y = 4 \cdot r^2 \cdot \pi$

MÆLIEININGAR

$1\ cm^3 = 1\ ml$ $1\ dm^3 = 1\ ltr$ $1\ m^3 = 1000\ ltr$

km - hm - dam - <u>m</u> - dm - cm - mm

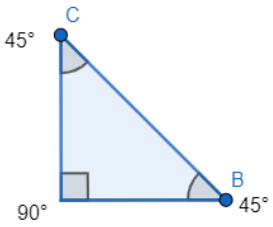
1 ltr. = 1000 ml // 1m = 10 dm // $1m^2 = 100\ dm^2$ // $1\ m^3 = 1000\ dm^3$

Horna- og rúmfræði formúlublað

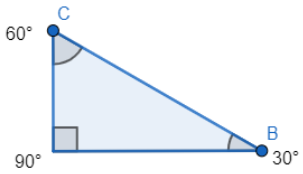
Tvívíð og þrívíð form

Sérstakir þríhyrningar:

a) Í *jafnarma* þríhyrningi með 45°, 45° og 90° horn er:
   a. Skammhliðar eru jafnlangar (*jafnarma*)
   b. Langhlið = skammhlið·$\sqrt{2}$



b) Í þríhyrningi með 30°, 60° og 90° horn er:
   a. Langhlið = 2·styttri skammhlið
   b. Lengri skammhlið = styttri skammhlið·$\sqrt{3}$

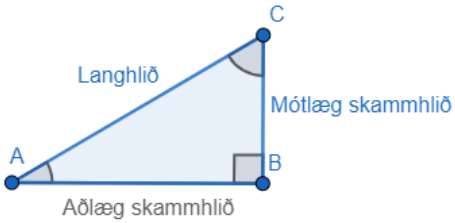


Hornaföll
Í rétthyrndum þríhyrningi gildir fyrir hvasst horn (A):

$$\sin(A)=\frac{mótlæg\ skammhlið}{langhlið}$$

$$\cos(A)=\frac{aðlæg\ skammhlið}{langhlið}$$

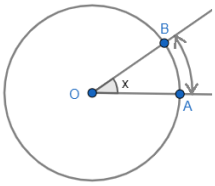
$$\tan(A)=\frac{mótlæg\ skammhlið}{aðlæg\ skammhlið}$$



Hornasumma n-hyrnings er:(n-2)·180°

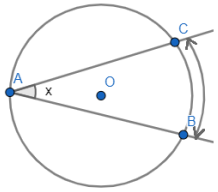
Miðhorn: Stærð hornsins er jöfn stærð boga sem það spannar

∠ x = hringboginn AB



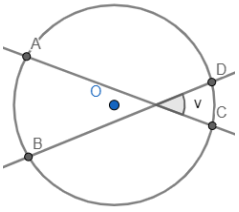
Ferilhorn: Stærð hornsins er jafnt hálfum boganum sem það spannar.

$$\angle x = \frac{hringboginn\ BC}{2}$$

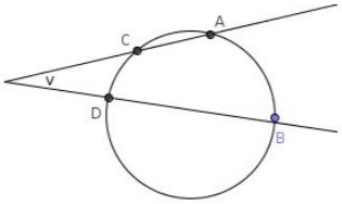


Innanvert horn: Stærð hornsins er jafnt hálfri summu boganna sem þau spanna.

$$\angle v = \frac{AB+CD}{2}$$



Utanvert horn: Stærð hornsins er jöfn hálfum mismuni boganna sem það spannar



$$V = \frac{(AB - CD)}{2}$$