Aus der Geometrie

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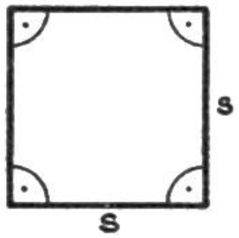
Aus der Geometrie.



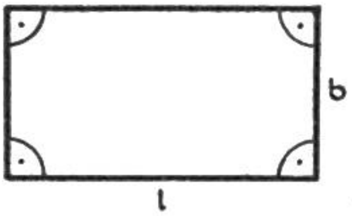
s = Seite.
U = Umfang.
F = Fläche.

Das Quadrat.

rechtwinklig, gleichseitig.

$$U = 4 \cdot s \qquad F = s \cdot s \ ^{*)}$$

$$s = \frac{U}{4} = U : 4 \qquad s = \sqrt{F}$$



l = Länge.
b = Breite.

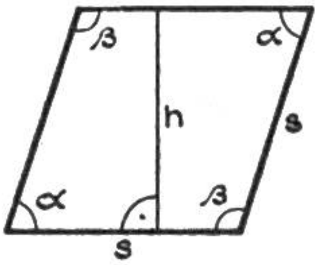
Das Rechteck.

rechtwinklig, ungleichseitig.

$$U = (l + b) \cdot 2 \qquad F = l \cdot b$$

$$l = \frac{U}{2} - b \qquad l = \frac{F}{b} = F : b$$

$$b = \frac{U}{2} - l \qquad b = \frac{F}{l} = F : l$$



s = Seite.
h = Höhe.

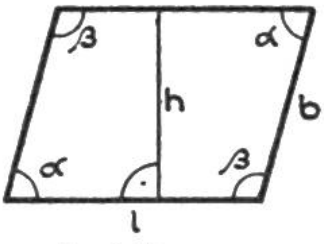
Der Rhombus, die Raute.

schiefwinklig, gleichseitig.

$$U = 4 \cdot s \qquad F = s \cdot h$$

$$s = \frac{U}{4} = U : 4 \qquad s = \frac{F}{h} = F : h$$

$$\measuredangle\alpha + \measuredangle\beta = 180^\circ \qquad h = \frac{F}{s} = F : s$$



l = Länge.
b = Breite.
h = Höhe.

Das Rhomboid, Parallelogramm.

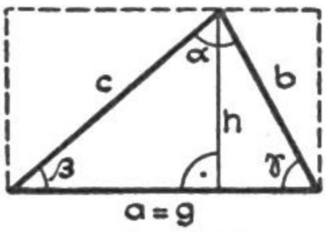
schiefwinklig, ungleichseitig.

$$U = (l + b) \cdot 2 \qquad F = l \cdot h$$

$$l = \frac{U}{2} - b \qquad l = \frac{F}{h} = F : h$$

$$b = \frac{U}{2} - l \qquad h = \frac{F}{l} = F : l$$

$$\measuredangle\alpha \quad \measuredangle\beta = 180^\circ$$



g = Grundlinie.
h = Höhe.

Das Dreieck.

$$F = \frac{g \cdot h}{2} \qquad g = \frac{2 \cdot F}{h} \qquad h = \frac{2 \cdot F}{g}$$

$$\measuredangle\alpha + \measuredangle\beta + \measuredangle\gamma = 180^\circ \qquad U = a + b + c$$

$$\measuredangle\alpha = 180^\circ - (\measuredangle\beta + \measuredangle\gamma) \qquad a = U - (b + c)$$

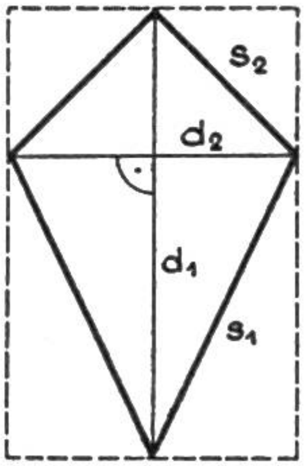
$$\measuredangle\beta = 180^\circ - (\measuredangle\alpha + \measuredangle\gamma) \qquad b = U - (a + c)$$

$$\measuredangle\gamma = 180^\circ - (\measuredangle\alpha + \measuredangle\beta) \qquad c = U - (a + b)$$

Spezialfälle: Das gleichseitige, die gleichschenkligen und die rechtwinkligen Dreiecke.

*) Algebraische Schreibweise: $F = s^2$, gelesen s hoch 2; ebenso für andere Flächenformeln verwendbar.

Das Drachenviereck.



$$U = (s_1 + s_2) \cdot 2 \qquad F = \frac{d_1 \cdot d_2}{2}$$

$$s_1 = \frac{U}{2} - s_2 \qquad d_1 = \frac{2 \cdot F}{d_2}$$

$$s_2 = \frac{U}{2} - s_1 \qquad d_2 = \frac{2 \cdot F}{d_1}$$

d_1 = lange Diagonale.
d_2 = kurze Diagonale.
s_1 = lange Seite.
s_2 = kurze Seite.

Spezialfälle:

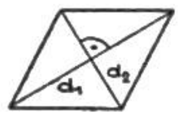
Quadrat:

$$F = \frac{d \cdot d}{2}$$

$$d = \sqrt{2 \cdot F}$$

d = Diagonale.

Rhombus:



$$F = \frac{d_1 \cdot d_2}{2}$$

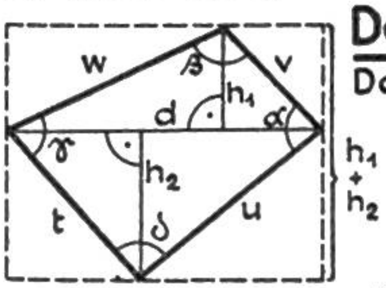
$$d_1 = \frac{2 \cdot F}{d_2}$$

$$d_2 = \frac{2 \cdot F}{d_1}$$

d_1 = lange Diagonale.
d_2 = kurze Diagonale.

Das Trapezoid.

Das unregelmässige Viereck.



$$F = \frac{(h_1 + h_2) \cdot d}{2} \qquad d = \frac{2 \cdot F}{(h_1 + h_2)}$$

$$h_1 = \frac{2 \cdot F}{d} - h_2 \qquad h_2 = \frac{2 \cdot F}{d} - h_1$$

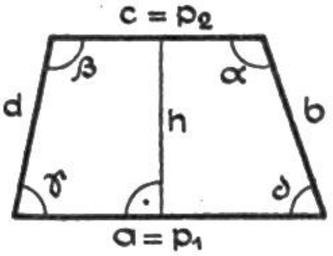
$$\measuredangle\alpha + \measuredangle\beta + \measuredangle\gamma + \measuredangle\delta = 360^\circ \qquad U = t + u + v + w$$

$$\measuredangle\alpha = 360^\circ - (\measuredangle\beta + \measuredangle\gamma + \measuredangle\delta) \qquad t = U - (u + v + w)$$

u.s.w. u.s.w.

d = Diagonale
h_1 = Höhe 1
h_2 = Höhe 2

Das Trapez.



$$F = \frac{(p_1 + p_2) \cdot h}{2} \qquad h = \frac{2 \cdot F}{(p_1 + p_2)}$$

$$p_1 = \frac{2 \cdot F}{h} - p_2 \qquad p_2 = \frac{2 \cdot F}{h} - p_1$$

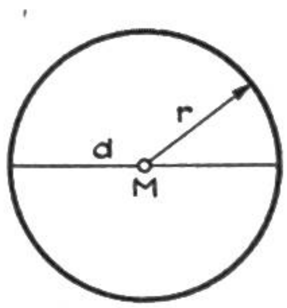
$$\measuredangle\alpha + \measuredangle\beta + \measuredangle\gamma + \measuredangle\delta = 360^\circ \qquad U = a + b + c + d$$

$$\measuredangle\alpha = 360^\circ - (\measuredangle\beta + \measuredangle\gamma + \measuredangle\delta) \qquad a = U - (b + c + d)$$

u.s.w. u.s.w.

p_1 = grosse Parallele.
p_2 = kleine Parallele.
h = Höhe.

Der Kreis.



$$U = d \cdot \pi \qquad U = 2 \cdot r \cdot \pi$$

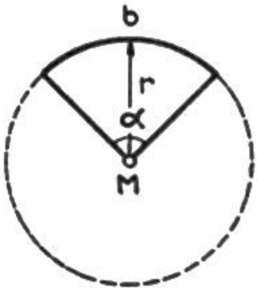
$$d = \frac{U}{\pi} \qquad r = \frac{U}{2 \cdot \pi}$$

$$F = r \cdot r \cdot \pi = \frac{d \cdot d \cdot \pi}{4} = \frac{U \cdot U}{4 \cdot \pi}$$

$$r = \sqrt{\frac{F}{\pi}} \qquad d = 2 \cdot \sqrt{\frac{F}{\pi}} \qquad U = 2 \cdot \sqrt{F \cdot \pi}$$

d = Durchmesser.
r = Radius.
M = Mittelpunkt.

Spezialfälle: Halbkreis, Viertelkreis.



r = Radius.
b = Kreisbogen.
α = Zentriwinkel.
M = Mittelpunkt.

Der Kreissektor.

$$b = \frac{U \cdot \alpha}{360} = \frac{d \cdot \pi \cdot \alpha}{360} = \frac{r \cdot \pi \cdot \alpha}{180}$$

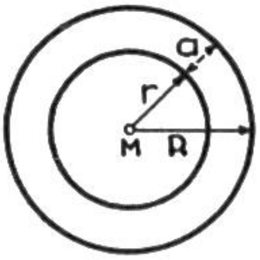
$$\alpha = \frac{b \cdot 360}{U} = \frac{b \cdot 360}{d \cdot \pi} = \frac{b \cdot 180}{r \cdot \pi}$$

$$F = \frac{b \cdot r}{2} \qquad b = \frac{2 \cdot F}{r} \qquad r = \frac{2 \cdot F}{b}$$

$$F = \frac{r \cdot r \cdot \pi \cdot \alpha}{360} = \frac{d \cdot d \cdot \pi \cdot \alpha}{4 \cdot 360} = \frac{U \cdot U \cdot \alpha}{4 \cdot \pi \cdot 360}$$

$$\alpha = \frac{F \cdot 360}{r \cdot r \cdot \pi} = \frac{F \cdot 360 \cdot 4}{d \cdot d \cdot \pi} = \frac{F \cdot 360 \cdot 4 \cdot \pi}{U \cdot U}$$

$$r = 6 \cdot \sqrt{\frac{F \cdot 10}{\alpha \cdot \pi}} \qquad d = 12 \cdot \sqrt{\frac{F \cdot 10}{\alpha \cdot \pi}} \qquad U = 12 \cdot \sqrt{\frac{F \cdot 10 \cdot \pi}{\alpha}}$$

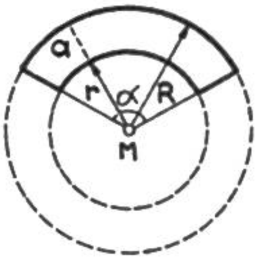


R = äusserer Radius.
r = innerer Radius.
a = radiale Breite des Kreisrings.
M = Mittelpunkt.

Der Kreisring.

$$F = (R + r) \cdot (R - r) \cdot \pi$$
$$= (R + r) \cdot a \cdot \pi$$
$$= (2 \cdot r + a) \cdot a \cdot \pi = (d + a) \cdot a \cdot \pi$$
$$= (2 \cdot R - a) \cdot a \cdot \pi = (D - a) \cdot a \cdot \pi$$

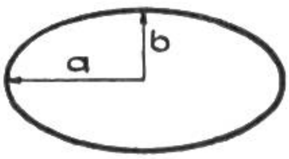
Das Kreisringstück.



R = äusserer Radius.
r = innerer Radius.
a = radiale Breite des Kreisringstücks.
α = Zentriwinkel.
M = Mittelpunkt.

$$F = (R + r) \cdot (R - r) \cdot \pi \cdot \frac{\alpha}{360}$$
$$= (R + r) \cdot a \cdot \pi \cdot \frac{\alpha}{360}$$
$$= (2 \cdot r + a) \cdot a \cdot \pi \cdot \frac{\alpha}{360} = (d + a) \cdot a \cdot \pi \cdot \frac{\alpha}{360}$$
$$= (2 \cdot R - a) \cdot a \cdot \pi \cdot \frac{\alpha}{360} = (D - a) \cdot a \cdot \pi \cdot \frac{\alpha}{360}$$

Die Ellipse.

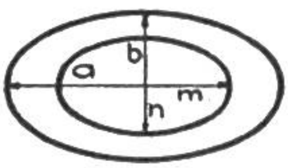


$$F = a \cdot b \cdot \pi$$

$$a = \frac{F}{b \cdot \pi} \qquad b = \frac{F}{a \cdot \pi}$$

a = halbe grosse Achse.
b = halbe kleine Achse.

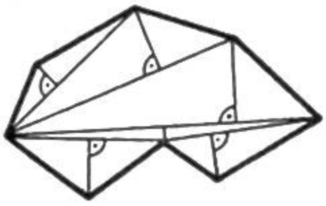
Der elliptische Ring.

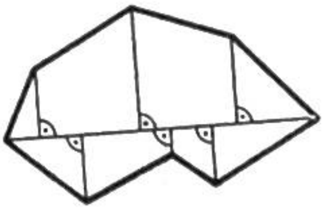


$$F = (a \cdot b - m \cdot n) \cdot \pi$$

a, b = halbe Achsen der äussern Ellipse.
m, n = halbe Achsen der innern Ellipse.

Das unregelmässige Vieleck.





Umfang = Summe aller Seiten.

Fläche = man zerlegt die Vieleckfläche:

a. mit Diagonalen in Dreiecke und eventuell Trapezoide, berechnet diese Teile und addiert die Teilresultate.

b. mit einer passenden Diagonale und auf dieser rechtwinklig errichtete Höhen zu den Eckpunkten in Dreiecke und Trapeze, berechnet diese Teile einzeln und addiert die Teilresultate.

Das regelmässige Vieleck.

R = Radius d. Umkreis.
r = Radius d. Jnkreis.
n = Seitenzahl.
s = Vieleckseite.
α = Zentriwinkel.
β = Vieleckwinkel.

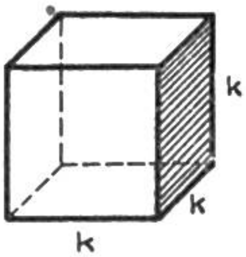
$$U = n \cdot s \qquad n = \frac{U}{s} \qquad s = \frac{U}{n}$$

$$F = \frac{n \cdot s \cdot r}{2} \qquad n = \frac{2 \cdot F}{s \cdot r}$$

$$r = \frac{2 \cdot F}{n \cdot s} \qquad s = \frac{2 \cdot F}{n \cdot r}$$

$$\measuredangle \alpha = \frac{360^\circ}{n} \qquad \measuredangle \beta = 180^\circ - \measuredangle \alpha$$

Der Würfel.



k = Kante.
K = Gesamt-kantenlänge.
M = Mantel.
O = Oberfläche.
J = Jnhalt.

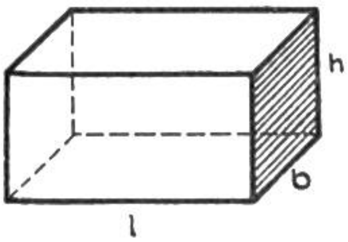
$$K = 12 \cdot k \qquad k = \frac{K}{12} = K : 12$$

$$M = k \cdot k \cdot 4 \qquad k = \sqrt{\frac{M}{4}} = \frac{1}{2}\sqrt{M}$$

$$O = k \cdot k \cdot 6 \qquad k = \sqrt{\frac{O}{6}}$$

$$J = k \cdot k \cdot k \ ^{*)} \qquad k = \sqrt[3]{J}$$

Der Quader.



l = Länge.
b = Breite.
h = Höhe.

$$K = (l + b + h) \cdot 4$$

$$l = \frac{K}{4} - (b + h)$$ ebenso b und h.

$$M = (l + b) \cdot 2 \cdot h$$

$$l = \frac{M}{2 \cdot h} - b$$, ebenso b; $$h = \frac{M}{2 \cdot (l + b)}$$

$$O = (l \cdot b + l \cdot h + b \cdot h) \cdot 2$$

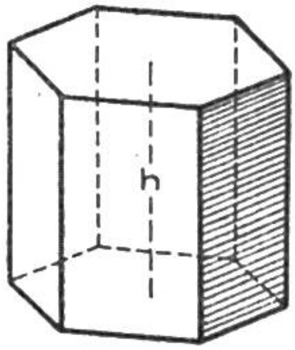
$$l = \left(\frac{O}{2} - b \cdot h\right) : (b + h)$$ ebenso b und h.

$$J = l \cdot b \cdot h$$

$$l = \frac{J}{b \cdot h} \qquad b = \frac{J}{l \cdot h} \qquad h = \frac{J}{l \cdot b}$$

*) Algebraische Schreibweise: $J = k^3$, gelesen k hoch 3; ebenso für andere Jnhaltsformeln verwendbar.

Das Prisma.



K = Gesamtkantenlänge.
h = Höhe.
n = Zahl der Höhenkanten.
U = Umfang der Grundfläche.
G = Grundfläche.

$$K = 2 \cdot U + n \cdot h$$

$$U = \frac{K - n \cdot h}{2} \qquad n = \frac{K - 2 \cdot U}{h} \qquad h = \frac{K - 2 \cdot U}{n}$$

$$M = U \cdot h$$

$$U = \frac{M}{h} \qquad h = \frac{M}{U}$$

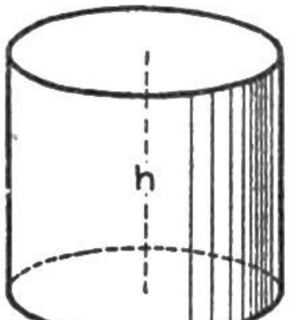
$$O = M + 2 \cdot G$$

$$M = O - 2 \cdot G \qquad G = \frac{O - M}{2}$$

$$J = G \cdot h$$

$$G = \frac{J}{h} \qquad h = \frac{J}{G}$$

Der Zylinder, die Walze.



r = Radius.
d = Durchmesser.
h = Höhe.
U = Umfang.
G = Grundfläche.
M = Mantel.
O = Oberfläche.
J = Jnhalt.

$$M = U \cdot h = d \cdot \pi \cdot h = 2 \cdot r \cdot \pi \cdot h$$

$$h = \frac{M}{U} = \frac{M}{d \cdot \pi} = \frac{M}{2 \cdot r \cdot \pi}$$

$$U = \frac{M}{h} \qquad d = \frac{M}{h \cdot \pi} \qquad r = \frac{M}{2 \cdot h \cdot \pi}$$

$$O = M + 2 \cdot G$$

$$= \left(h + \frac{U}{2 \cdot \pi}\right) \cdot U = \left(h + \frac{d}{2}\right) \cdot d \cdot \pi = (h + r) \cdot 2 \cdot r \cdot \pi$$

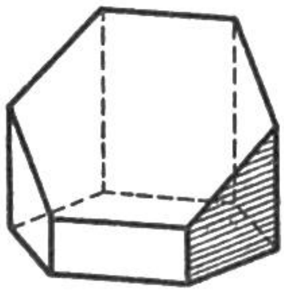
$$J = G \cdot h$$

$$= r \cdot r \cdot \pi \cdot h = \frac{d \cdot d \cdot \pi \cdot h}{4} = \frac{U \cdot U \cdot h}{4 \cdot \pi}$$

$$h = \frac{J}{r \cdot r \cdot \pi} = \frac{4 \cdot J}{d \cdot d \cdot \pi} = \frac{4 \cdot J \cdot \pi}{U \cdot U}$$

$$r = \sqrt{\frac{J}{h \cdot \pi}} \qquad d = 2 \cdot \sqrt{\frac{J}{h \cdot \pi}} \qquad U = 2 \cdot \sqrt{\frac{J \cdot \pi}{h}}$$

Das schiefabgeschnittene Prisma.



h = Höhen.
n = Zahl der Höhen.
G_1 = Grundfläche.
G_2 = Deckfläche.

$$M = \frac{U \cdot (h_1 + h_2 + \ldots + h_n)}{n}$$

$$h_1 = \frac{n \cdot M}{U} - (h_2 + h_3 + \ldots + h_n) \quad \text{ebenso } h_2, h_3, \ldots, h_n$$

$$U = \frac{n \cdot M}{(h_1 + h_2 + \ldots + h_n)}$$

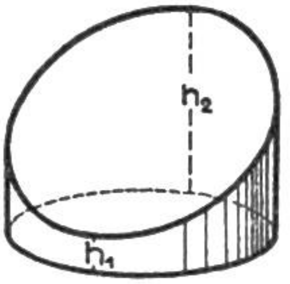
$$O = M + G_1 + G_2$$

$$J = \frac{G_1 \cdot (h_1 + h_2 + \ldots + h_n)}{n}$$

$$G_1 = \frac{n \cdot J}{(h_1 + h_2 + \ldots + h_n)}$$

$$h_1 = \frac{n \cdot J}{G_1} - (h_2 + h_3 + \ldots + h_n) \quad \text{ebenso } h_2, h_3, \ldots, h_n$$

Der schiefabgeschnittene Zylinder.



h_1 = kleinste Höhe.
h_2 = grösste Höhe.
G_1 = Grundfläche.
G_2 = Deckfläche.

$$M = \frac{U\cdot(h_1+h_2)}{2} = \frac{d\cdot\pi\cdot(h_1+h_2)}{2} = r\cdot\pi\cdot(h_1+h_2)$$

$$h_1 = \frac{2\cdot M}{U} - h_2 = \frac{2\cdot M}{d\cdot\pi} - h_2 = \frac{M}{r\cdot\pi} - h_2 \quad \text{ebs. } h_2$$

$$U = \frac{2\cdot M}{(h_1+h_2)} \qquad d = \frac{2\cdot M}{(h_1+h_2)\cdot\pi} \qquad r = \frac{M}{(h_1+h_2)\cdot\pi}$$

$$O = M + G_1 + G_2$$

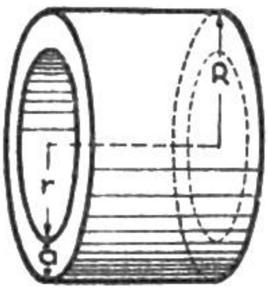
$$J = \frac{G_1\cdot(h_1+h_2)}{2}$$

$$= \frac{r\cdot r\cdot\pi\cdot(h_1+h_2)}{2} = \frac{d\cdot d\cdot\pi\cdot(h_1+h_2)}{8} = \frac{U\cdot U\cdot(h_1+h_2)}{8\cdot\pi}$$

$$h_1 = \frac{2\cdot J}{r\cdot r\cdot\pi} - h_2 = \frac{8\cdot J}{d\cdot d\cdot\pi} - h_2 = \frac{8\cdot J\cdot\pi}{U\cdot U} - h_2 \quad \text{ebs. } h_2$$

$$r = \sqrt{\frac{2\cdot J}{(h_1+h_2)\cdot\pi}} \qquad d = 2\cdot\sqrt{\frac{2\cdot J}{(h_1+h_2)\cdot\pi}} \qquad U = 2\cdot\sqrt{\frac{2\cdot J\cdot\pi}{(h_1+h_2)}}$$

Der Hohlzylinder.



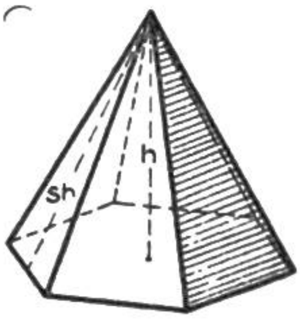
R = äusserer Radius.
r = innerer Radius.
a = Wandstärke.

$$J = (R+r)\cdot(R-r)\cdot\pi\cdot h = (R+r)\cdot a\cdot\pi\cdot h$$

$$= (2\cdot r + a)\cdot a\cdot\pi\cdot h = (d + a)\cdot a\cdot\pi\cdot h$$

$$= (2\cdot R - a)\cdot a\cdot\pi\cdot h = (D - a)\cdot a\cdot\pi\cdot h$$

Die Pyramide.



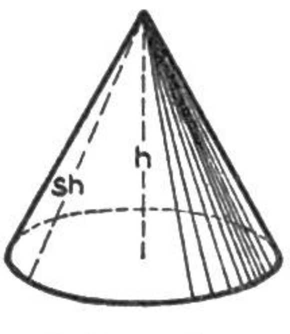
sh = Seitenhöhe.
h = Höhe.

$$M = \frac{U\cdot sh}{2} \qquad U = \frac{2\cdot M}{sh} \qquad sh = \frac{2\cdot M}{U}$$

$$O \quad M + G$$

$$J = \frac{G\cdot h}{3} \qquad G = \frac{3\cdot J}{h} \qquad h = \frac{3\cdot J}{G}$$

Der Kegel.



sh = Seitenhöhe.
h = Höhe.
r = Radius.

$$M = \frac{U\cdot sh}{2} = \frac{d\cdot\pi\cdot sh}{2} = r\cdot\pi\cdot sh$$

$$sh = \frac{2\cdot M}{U} = \frac{2\cdot M}{d\cdot\pi} = \frac{M}{r\cdot\pi}$$

$$U = \frac{2\cdot M}{sh} \qquad d = \frac{2\cdot M}{sh\cdot\pi} \qquad r = \frac{M}{sh\cdot\pi}$$

$$O = M + G = (sh + r)\cdot r\cdot\pi$$

$$J = \frac{G\cdot h}{3}$$

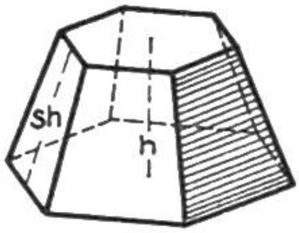
$$= \frac{r\cdot r\cdot\pi\cdot h}{3} = \frac{d\cdot d\cdot\pi\cdot h}{12} = \frac{U\cdot U\cdot h}{12\cdot\pi}$$

$$h = \frac{3\cdot J}{r\cdot r\cdot\pi} = \frac{12\cdot J}{d\cdot d\cdot\pi} = \frac{12\cdot J\cdot\pi}{U\cdot U}$$

$$r = \sqrt{\frac{3\cdot J}{h\cdot\pi}} \qquad d = 2\cdot\sqrt{\frac{3\cdot J}{h\cdot\pi}} \qquad U = 2\sqrt{\frac{3\cdot J\cdot\pi}{h}}$$

Tafel 7.

Die abgestumpfte Pyramide.



sh = Seitenhöhe.
h = Höhe.
U = Umfang der Grundfläche.
u = Umfang der Deckfläche.
G = Grundfläche.
g = Deckfläche.

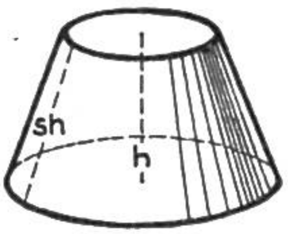
$$M = \frac{(U+u)\cdot sh}{2}$$

$$U = \frac{2\cdot M}{sh} - u \quad \text{ebenso } u\,; \quad sh = \frac{2\cdot M}{(U+u)}$$

$$O = M + G + g$$

$$J = \frac{(G + \sqrt{G\cdot g} + g)\cdot h}{3}$$

Der abgestumpfte Kegel.



sh = Seitenhöhe.
h = Höhe.
R = Radius der Grundfläche.
r = Radius der Deckfläche.

$$M = (R+r)\cdot\pi\cdot sh = \frac{(D+d)\cdot\pi\cdot sh}{2} = \frac{(U+u)\cdot sh}{2}$$

$$sh = \frac{M}{(R+r)\cdot\pi} = \frac{2\cdot M}{(D+d)\cdot\pi} = \frac{2\cdot M}{(U+u)}$$

$$R = \frac{M}{\pi\cdot sh} - r \quad D = \frac{M\cdot 2}{\pi\cdot sh} - d \quad U = \frac{M\cdot 2}{sh} - u$$

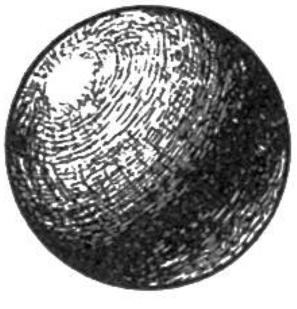
ebenso r, d und u.

$$O = M + G + g$$
$$= (R\cdot R + [R+r]\cdot sh + r\cdot r)\cdot\pi$$

$$J = \frac{(R\cdot R + R\cdot r + r\cdot r)\cdot\pi\cdot h}{3} = \frac{(D\cdot D + D\cdot d + d\cdot d)\cdot\pi\cdot h}{12}$$
$$= \frac{(U\cdot U + U\cdot u + u\cdot u)\cdot h}{12\cdot\pi}$$

$$h = \frac{3\cdot J}{(R\cdot R + R\cdot r + r\cdot r)\cdot\pi} = \frac{12\cdot J}{(D\cdot D + D\cdot d + d\cdot d)\cdot\pi}$$
$$= \frac{12\cdot J\cdot\pi}{(U\cdot U + U\cdot u + u\cdot u)}$$

Die Kugel.



r = Radius.

$$O = 4\cdot r\cdot r\cdot\pi = d\cdot d\cdot\pi = \frac{U\cdot U}{\pi}$$

$$r = \frac{1}{2}\sqrt{\frac{O}{\pi}} \quad d = \sqrt{\frac{O}{\pi}} \quad U = \sqrt{O\cdot\pi}$$

$$J = \frac{4\cdot r\cdot r\cdot r\cdot\pi}{3} = \frac{d\cdot d\cdot d\cdot\pi}{6} = \frac{U\cdot U\cdot U}{6\cdot\pi\cdot\pi}$$

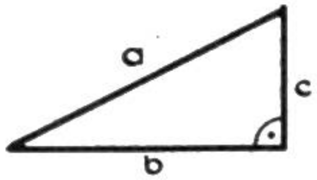
$$r = \sqrt[3]{\frac{3\cdot J}{4\cdot\pi}} \quad d = \sqrt[3]{\frac{6\cdot J}{\pi}} \quad U = \sqrt[3]{6\cdot J\cdot\pi\cdot\pi}$$

Die Hohlkugel.

R = äusserer Radius.
r = innerer Radius.

$$J = \frac{4\cdot(R\cdot R\cdot R - r\cdot r\cdot r)\cdot\pi}{3}$$
$$= \frac{(D\cdot D\cdot D - d\cdot d\cdot d)\cdot\pi}{6}$$
$$= \frac{(U\cdot U\cdot U - u\cdot u\cdot u)}{6\cdot\pi\cdot\pi}$$

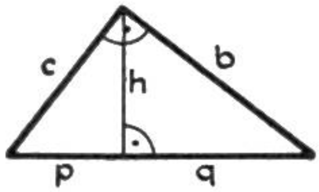
Der Lehrsatz des Pythagoras.



a = Hypotenuse
b und c = Katheten

Jm rechtwinkligen Dreieck ist das Hypotenusenquadrat gleich der Summe der beiden Kathetenquadrate.

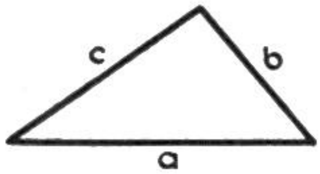
$$a^2 = b^2 + c^2 \qquad a = \sqrt{b^2 + c^2}$$
$$b^2 = a^2 - c^2 \qquad b = \sqrt{a^2 - c^2} = \sqrt{(a+c)\cdot(a-c)}$$
$$c^2 = a^2 - b^2 \qquad c = \sqrt{a^2 - b^2} = \sqrt{(a+b)\cdot(a-b)}$$



p und q = Abschnitte der Hypotenuse
$p + q = a$

$$b^2 = a\cdot q \qquad b = \sqrt{a\cdot q} \qquad q = \frac{b^2}{a} \qquad a = \frac{b^2}{q}$$
$$c^2 = a\cdot p \qquad c = \sqrt{a\cdot p} \qquad p = \frac{c^2}{a} \qquad a = \frac{c^2}{p}$$
$$h^2 = p\cdot q \qquad h = \sqrt{p\cdot q} \qquad p = \frac{h^2}{q} \qquad q = \frac{h^2}{p}$$

Die Formel des Heron.



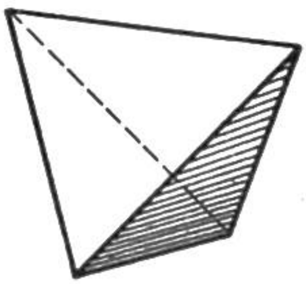
a, b und c = Seiten des ungleichseitigen Dreiecks.

$$F = \sqrt{s\cdot(s-a)\cdot(s-b)\cdot(s-c)}$$
$$s = \frac{U}{2} = \frac{a+b+c}{2}$$

Reguläre Polyeder.

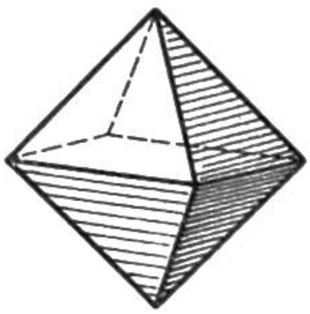
Tetraeder.

4 gleichseitige Dreieckflächen.



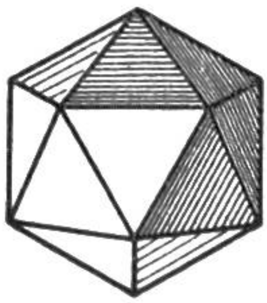
Oktaeder.

8 gleichseitige Dreieckflächen.



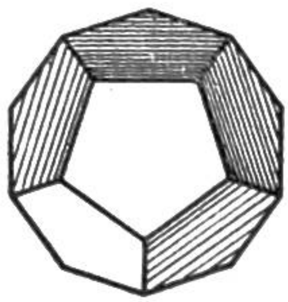
Ikosaeder.

20 gleichseitige Dreieckflächen.



Dodekaeder.

12 regelmässige Fünfeckflächen.



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