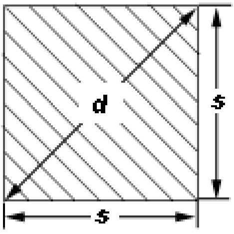
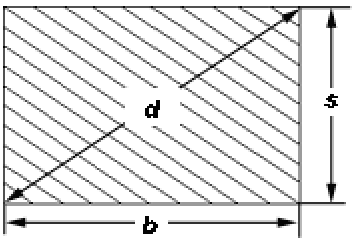
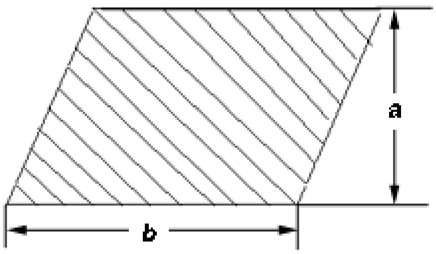
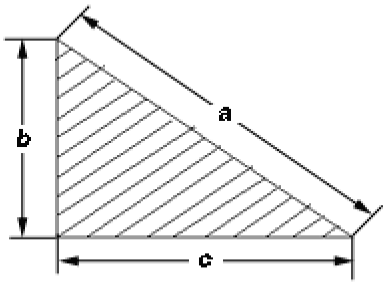
求積公式（平面）

A=面積

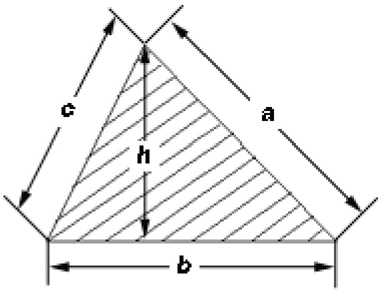
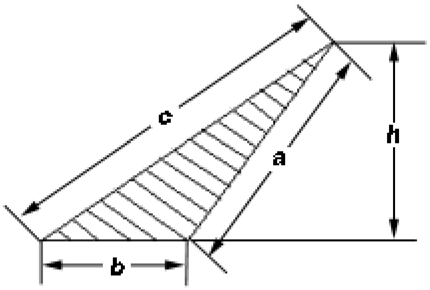
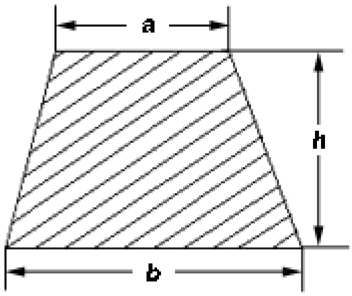
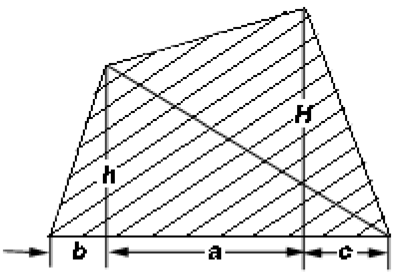
正方形	
	$A = s^2$ $A = \frac{1}{2}d^2$ $s = \frac{d}{\sqrt{2}} = 0.7071d = \sqrt{A}$ $d = \sqrt{2}s = 1.414s = 1.414\sqrt{A}$

長方形	
	$A = ab = a\sqrt{d^2 - a^2} = b\sqrt{d^2 - b^2}$ $d = \sqrt{a^2 + b^2}$ $a = \sqrt{d^2 - b^2} = A \div b$ $b = \sqrt{d^2 - a^2} = A \div a$

平行四辺形	
	$A = ab$ $a = A \div b$ $b = A \div a$ ［備考］ a 寸法は b 辺に対し直角に測ったもの

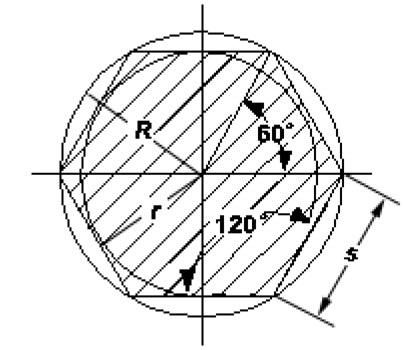
直角三角形	
	$A = \frac{bc}{2}$ $a = \sqrt{b^2 + c^2}$ $b = \sqrt{a^2 - c^2}$ $c = \sqrt{a^2 - b^2}$

A=面積

<table>
<tr><th colspan="2">鋭角三角形</th></tr>
<tr><td>
</td><td>$A = \frac{bh}{2} = \frac{b}{2}\sqrt{a^2 - \left(\frac{a^2 - b^2 + c^2}{2b}\right)^2}$
もし $s = \frac{1}{2}(a+b+c)$ とすれば
$A = \sqrt{s(s-a)(s-b)(s-c)}$</td></tr>
<tr><th colspan="2">鈍角三角形</th></tr>
<tr><td>
</td><td>$A = \frac{bh}{2} = \frac{b}{2}\sqrt{a^2 - \left(\frac{c^2 - a^2 - b^2}{2b}\right)^2}$
もし $s = \frac{1}{2}(a+b+c)$ とすれば
$A = \sqrt{s(s-a)(s-b)(s-c)}$</td></tr>
<tr><th colspan="2">台　形</th></tr>
<tr><td>
</td><td>$A = \frac{(a+b)h}{2}$</td></tr>
<tr><th colspan="2">不平行四辺形</th></tr>
<tr><td>
</td><td>$A = \frac{(H+h)a + bh + cH}{2}$
なお点線にて示すごとく二つの三角形となし、各々の面積を計算し、その和をもって不平行四辺形の面積を算出してもよい。</td></tr>
</table>

A=面積

正六角形



$R =$ 外形の半径

$r =$ 内接円の半径

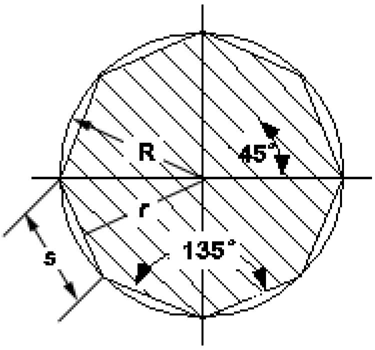
$A = \frac{3\sqrt{3}}{2}R^2 = 2.598R^2 = 2.598s^2$

$= 2\sqrt{3}r^2 = 3.464r^2$

$R = s = 1.155r$

$r = 0.866R = 0.866s$

正八角形



$R =$ 外形の半径

$r =$ 内接円の半径

$A = \frac{2}{\tan 22.5^\circ}s^2 = 4.828s^2$

$= 4R^2 \sin 45^\circ = 2.828R^2$

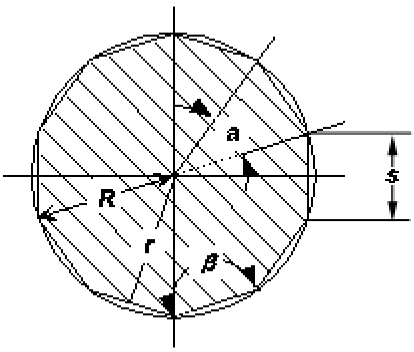
$= 8r^2 \tan 22.5^\circ = 3.314r^2$

$R = 1.373s = 1.082r$

$r = 1.207s = 0.924R$

$s = 0.765R = 0.828r$

正多角形



$n =$ 辺の数

$\alpha = 360^\circ \div n$

$\beta = 180^\circ - \alpha$

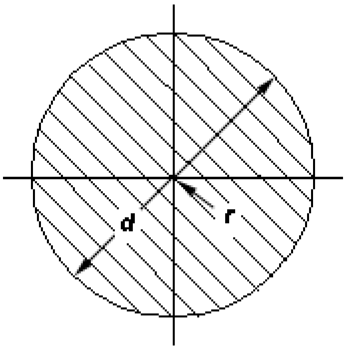
$A = \frac{nsr}{2} = \frac{ns}{2}\sqrt{R^2 - \frac{s^2}{4}}$

$R = \sqrt{r^2 + \frac{s^2}{4}} = \frac{r}{\cos\frac{\alpha}{2}} = \frac{s}{2\sin\frac{\alpha}{2}}$

$r = \sqrt{R^2 - \frac{s^2}{4}} = R\cos\frac{\alpha}{2} = \frac{s}{2\tan\frac{\alpha}{2}}$

$s = 2\sqrt{R^2 - r^2} = R\sin\frac{\alpha}{2} = r\tan\frac{\alpha}{2}$

円



$c =$ 円周

$A = \pi r^2 = 3.1416r^2 = 0.7854d^2$

$c = 2\pi r = 6.2832r = 3.1416d$

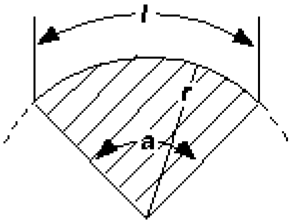
$r = 6.2832c = \sqrt{3.1416A} = 0.564\sqrt{A}$

$d = 3.1416c = \sqrt{0.7854A} = 1.128\sqrt{A}$

中心角 n° に対する弧の長さ $= 0.008727nd$

A=面積

円分



$l =$ 弧の長さ, $\alpha =$ 角度

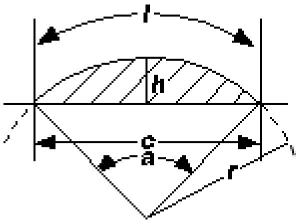
$$l = \frac{\pi r \alpha}{180} = 0.01745 r\alpha = \frac{2A}{r}$$

$$A = \frac{1}{2} r l = 0.008727 \alpha r^2$$

$$\alpha = \frac{57.296}{r}$$

$$r = \frac{2A}{l} = \frac{57.296}{\alpha}$$

欠 円



$l =$ 弧の長さ, $\alpha =$ 角度

$$c = 2\sqrt{h(2r-h)}$$

$$A = \frac{1}{2}\{rl - c(r-h)\}$$

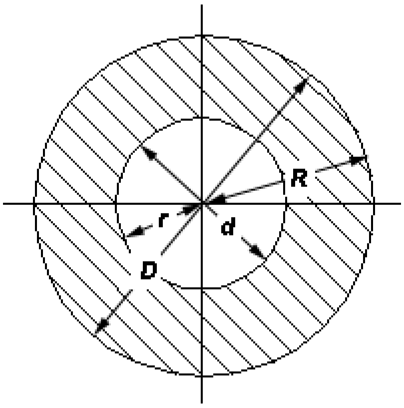
$$r = \frac{c^2 + 4h^2}{8h}$$

$$l = 0.01745 r\alpha$$

$$h = r - \frac{1}{2}\sqrt{4r^2 - c^2}$$

$$\alpha = \frac{57.296 l}{r}$$

環 形



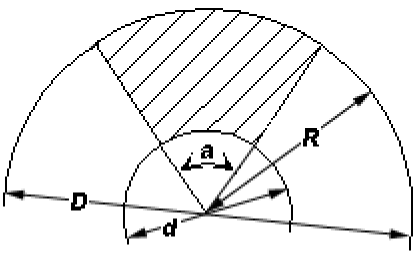
$$A = \pi\left(R^2 - r^2\right) = 3.1416\left(R^2 - r^2\right)$$

$$= 3.1416(R+r)(R-r)$$

$$= 0.7854\left(D^2 - d^2\right)$$

$$= 0.7854(D+d)(D-d)$$

扇 形

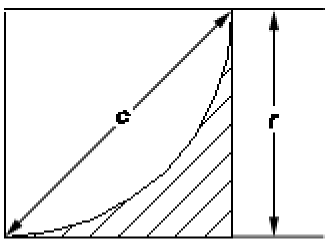


$\alpha =$ 角度

$$A = \frac{\alpha\pi}{360}\left(R^2 - r^2\right) = 0.00873\alpha\left(R^2 - r^2\right)$$

$$= \frac{\alpha\pi}{1440}\left(D^2 - d^2\right) = 0.00218\alpha\left(D^2 - d^2\right)$$

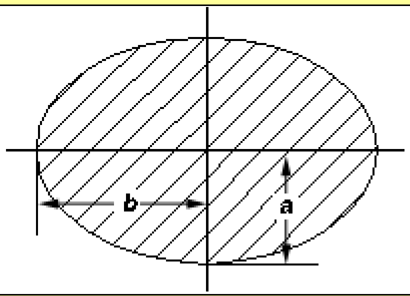
角 縁



$$A = r^2 - \frac{\pi r^2}{4} = 0.215 r^2 = 0.1075 c^2$$

A=面積

楕 円



$P =$ 楕円の周囲

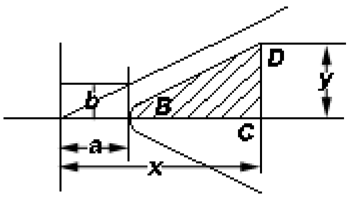
$A = \pi ab = 3.1416ab$

P を求める近似公式

1. $P = 3.1416\sqrt{2(a^2+b^2)}$

2. $P = 3.1416\sqrt{2(a^2+b^2) - \frac{(a-b)^2}{22}}$

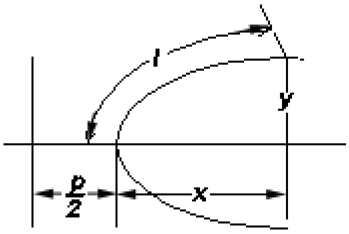
双 曲 線

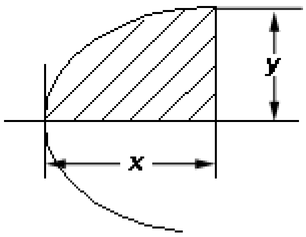


$P =$ 面積 BCD

$A = \frac{xy}{2} - \frac{ab}{2}\log\left(\frac{x}{a} + \frac{y}{b}\right)$

放 物 線





$A = \frac{2}{3}xy$

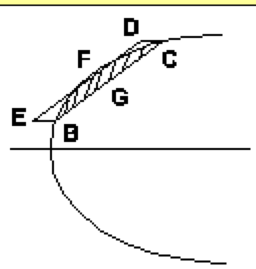
x が y に比べて小さいときの近似公式

1. $l = y\left\{1 + \frac{2}{3}\left(\frac{x}{y}\right)^2 - \frac{2}{5}\left(\frac{x}{y}\right)^2\right\}$

2. $l = \sqrt{y^2 + \frac{4}{3}x^2}$

（すなわち χ を底辺としYを高さとする短形の面積の 2/3 に等しい）

放物線切片

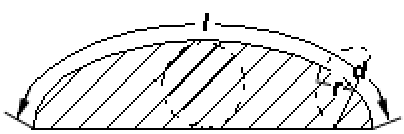


$A = \mathrm{BFC} = ($平行四辺形 BCDE の面積$) \times \frac{2}{3}$

BC と DE の垂直線上にある点の長さを FG とすると

$A = \mathrm{BFC} = \frac{2}{3}\mathrm{BC} \times \mathrm{FG}$

サイクロイド



$l =$ サイクロイドの長さ

$A = 3\pi r^2 = 9.4248r^2$

$= 2.3562d^2$

$= ($転動円の面積$) \times 3$

$l = 8r = 4d$