matemá-tica

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circunferência - linha que forma o círculo

↳ NÃO TEM ÁREA

círculo - linha + região de dentro

COMPRIMENTO DA CIRCUFERÊNCIA

$$C = 2\pi R$$

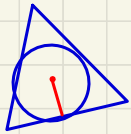
ÁREA DO CÍRCULO

$$Ac = \pi R^2$$

	30°	45°	60°	
sen	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\times R$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	$\times 2R$
tg	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\times 2R$

polígonos inscritos

AP



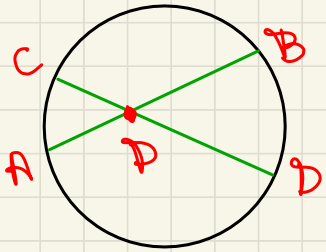
	△	□	⬡
ap	$\frac{R}{2}$	$\frac{R\sqrt{2}}{2}$	$\frac{R\sqrt{3}}{2}$
ℓ	$R\sqrt{3}$	$R\sqrt{2}$	R

polígonos circunscritos

	△	□	⬡
ap	R	R	R
ℓ	$2R\sqrt{3}$	$2R$	$\frac{2R\sqrt{3}}{3}$

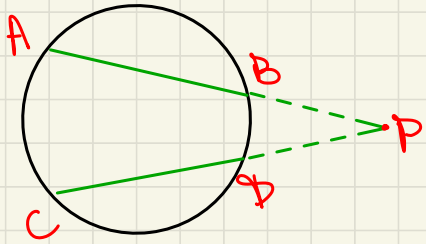
Relações métricas no círculo

quando 2 cordas se interceptam



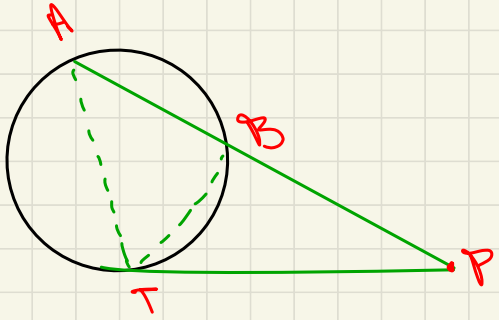
$$PA \cdot PB = PC \cdot PD$$

retas secantes



$$PA \cdot PB = PC \cdot PD$$

reta tangente

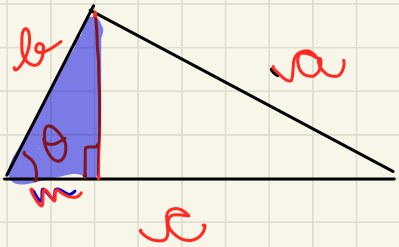


$$PA \cdot PB = PT \cdot PT$$

Lei dos cossenos

2 lados 1 ângulo

$\theta < 90°$

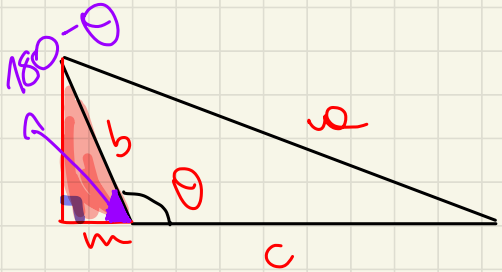


$\cos\theta = \frac{m}{b} \Rightarrow m = b \cdot \cos\theta$

$a^2 = b^2 + c^2 - 2cb \cdot \cos\theta$

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

$\theta > 90°$



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

$\cos(180-\theta) = -\cos\theta$

$\cos(180-\theta) = \frac{m}{b}$

$m = \cos(180-\theta) \cdot b$

$m = b(-\cos\theta)$

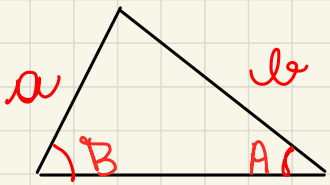
$m = -b\cos\theta$

$a^2 = b^2 + c^2 + 2c(-b \cdot \cos\theta)$

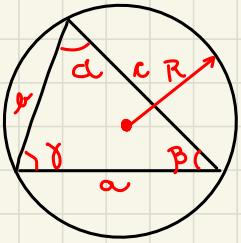
$120° = -\cos 60°$
$135 = -\cos 45°$
$150 = -\cos 30°$

Lei dos senos

2 a 1 a



$$\frac{b}{\operatorname{sen}\hat{B}} = \frac{a}{\operatorname{sen}\hat{A}}$$



$$\frac{a}{\operatorname{sen}\alpha} = 2R$$

$$\frac{a}{\operatorname{sen}\alpha} = d$$

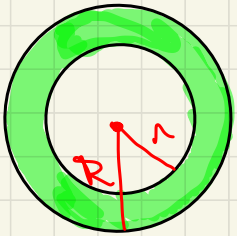
$$\frac{b}{\operatorname{sen}\beta} = d$$

$$\frac{c}{\operatorname{sen}\gamma} = d$$

$$d = 2R$$

$$\therefore \frac{a}{\operatorname{sen}\alpha} = \frac{b}{\operatorname{sen}\beta} = \frac{c}{\operatorname{sen}\gamma} = 2R$$

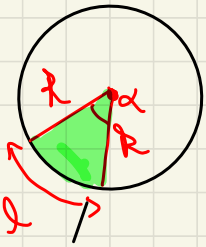
circunferências concêntricas



$$A = \pi R^2 - \pi r^2$$

$$\pi(R^2 - r^2)$$

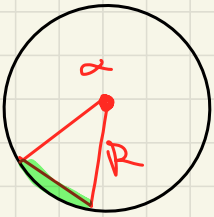
setor circular



$$A = \frac{l \cdot R}{2}$$

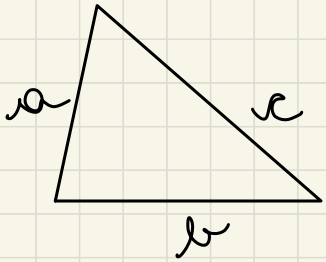
$$A = \frac{\pi \cdot R^2 \cdot \alpha}{360}$$

segmento circular



$$A_{seg} = A_{set} - A_{\triangle}$$

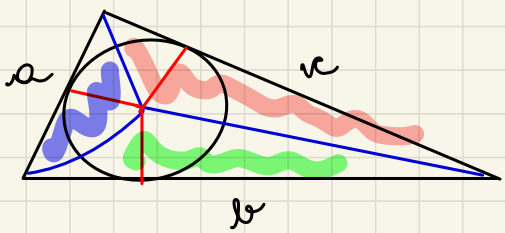
fórmula de Heão



$$A = \sqrt{p(p-a)(p-b)(p-c)}$$

$$p = \frac{a+b+c}{2}$$

circunferência inscrita

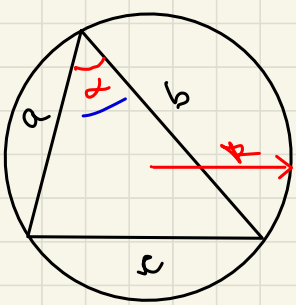


$$A = \frac{a \cdot r}{2} + \frac{b \cdot r}{2} + \frac{c \cdot r}{2} =$$

$$r \cdot \left(\frac{a+b+c}{2}\right)$$

$$A = p \cdot r$$

circunferência circunscrita



$$\frac{c}{\operatorname{sen}\alpha} = d = 2R$$

$$\operatorname{sen}\alpha = \frac{c}{2R}$$

$$A = \frac{1}{2} \cdot bc \cdot \operatorname{sen}\alpha$$

$$A = \frac{1}{2} \cdot ab \cdot \frac{c}{2R}$$

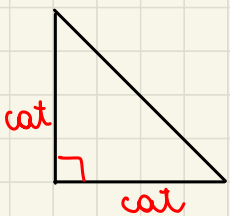
$$A = \frac{abc}{4R}$$

áreas de regiões poligonais

triângulo qualquer

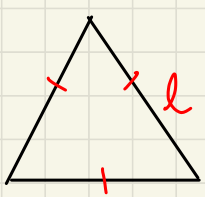
$$\frac{b \cdot h}{2}$$

triângulo retângulo



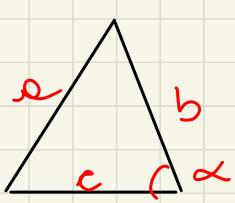
$$A = \frac{cat \cdot cat}{2}$$

triângulo equilátero



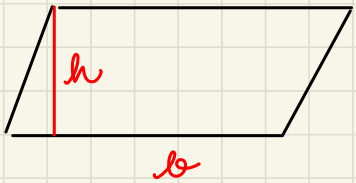
$$A = \frac{l^2\sqrt{3}}{4} \qquad h = \frac{l\sqrt{3}}{2}$$

triângulo com ângulo



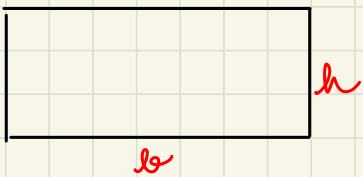
$$A = \frac{1}{2} \cdot bc \cdot \operatorname{sen}\alpha$$

paralelogramo



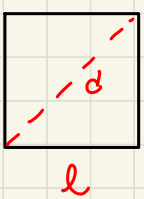
$$A = b \cdot h$$

retângulo



$$A = b \cdot h$$

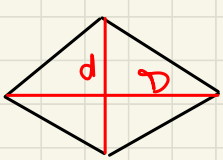
quadrado



$$A = \ell^2$$

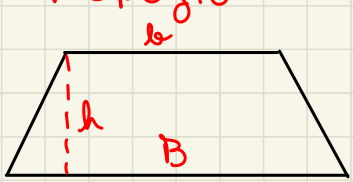
$$d = \ell\sqrt{2}$$

losango



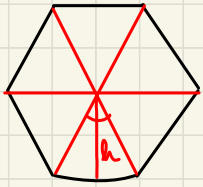
$$A = \frac{D \cdot d}{2}$$

trapézio



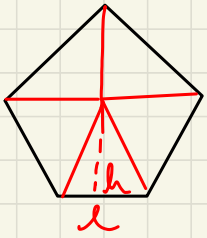
$$A = \frac{(B + b)\,h}{2}$$

hexágono



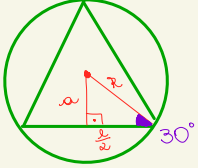
$$A = \frac{6 \cdot b \cdot h}{2} \text{ ou } \frac{6 \cdot l^2 \sqrt{3}}{4}$$

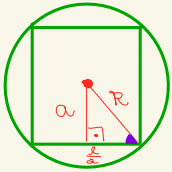
pentágono



$$A = 5 \cdot \frac{1}{2} \cdot bc \cdot \operatorname{sen} \alpha$$

$$A = \frac{b \cdot h}{2}$$


a
R
R/2
30°


a
R
R/2