



# PŘEHLED VZORCŮ Z MATEMATIKY

PRO ŽÁKY ZÁKLADNÍ ŠKOLY

## VÝRAZY

$$(a + b)^2 = (a + b) \cdot (a + b) = a^2 + 2ab + b^2$$

$$(a - b)^2 = (a - b) \cdot (a - b) = a^2 - 2ab + b^2$$

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

Vytýkání:  $2a + 2b + 2c = 2 \cdot (a + b + c)$

## MOCNINY A ODMOCNINY

$$a^1 = a$$

$$(a \cdot b)^r = a^r \cdot b^r$$

$$\sqrt[r]{a} \cdot \sqrt[r]{b} = \sqrt[r]{a \cdot b}$$

$$a^0 = 1$$

$$\left(\frac{a}{b}\right)^r = \frac{a^r}{b^r}$$

$$a^5 = a \cdot a \cdot a \cdot a \cdot a$$

$$a^r \cdot a^s = a^{r+s}$$

$$\frac{a^r}{a^s} = a^{r-s}$$

## KVADRATICKÁ ROVNICE

$$ax^2 + bx + c = 0$$

$a, b, c$  - čísla

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

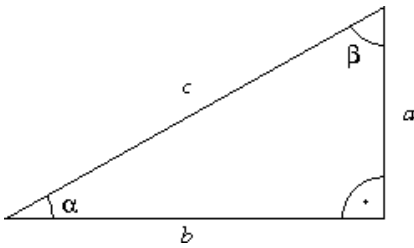
$a \neq 0$

$D$  - diskriminant

$$D = b^2 - 4ac$$

$$D \geq 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**GONIOMETRIE**

$$\sin \alpha = \frac{\text{protilehlá odvěsna}}{\text{přepona}} = \frac{a}{c}$$

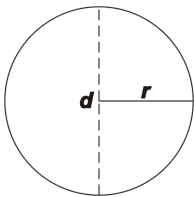
$$\cos \alpha = \frac{\text{přilehlá odvěsna}}{\text{přepona}} = \frac{b}{c}$$

**Odvěsny:** strana  $a$ , strana  $b$

**Přepona:** strana  $c$

$$\operatorname{tga} = \frac{\text{protilehlá odvěsna}}{\text{přilehlá odvěsna}} = \frac{a}{b} = \frac{\sin \alpha}{\cos \alpha}$$

$$\operatorname{cotga} = \frac{\text{přilehlá odvěsna}}{\text{protilehlá odvěsna}} = \frac{b}{a} = \frac{\cos \alpha}{\sin \alpha}$$

**OBVODY A OBSAHY PLOCH****Kružnice, kruh**

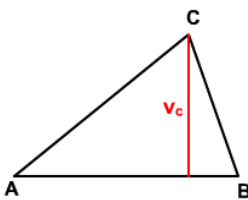
$$S = \pi \cdot r^2 = \frac{\pi \cdot d^2}{4}$$

$$o = 2\pi \cdot r = \pi \cdot d$$

$$2r = d$$

**Trojúhelník**

**a) obecný**

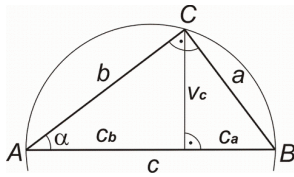


$$S = \frac{a \cdot v_a}{2} = \frac{b \cdot v_b}{2} = \frac{c \cdot v_c}{2}$$

$$o = a + b + c$$



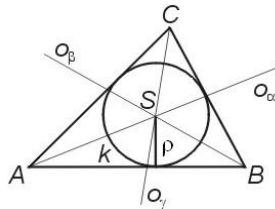
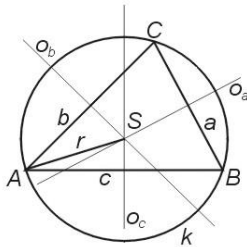
### b) pravouhlý



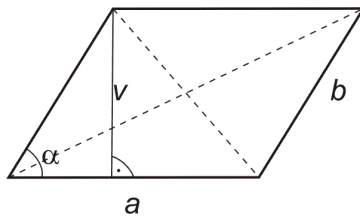
$$S = \frac{a \cdot b}{2}$$

$$o = a + b + c$$

### Kružnice opsaná a vepsaná:



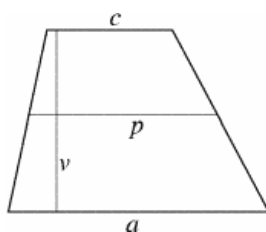
### Rovnoběžník



$$S = a \cdot v_a$$

$$o = 2(a + b)$$

### Lichoběžník



$$S = \frac{(a+c) \cdot v}{2}$$

střední příčka:  $p = \frac{a+c}{2}$

$$o = a + b + c + d$$



## OBSAHY A OBJEMY TĚLES

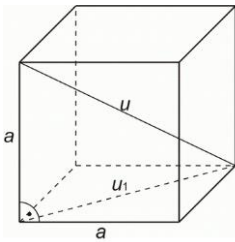
$$S = S_p + S_{pl}$$

$$V = S_p \cdot v$$

$S_p$  - obsah podstavy

$S_{pl}$  - obsah pláště

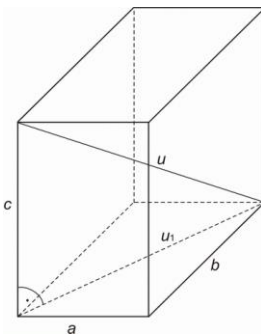
### Krychle



$$S = 6 \cdot a^2$$

$$V = a^3$$

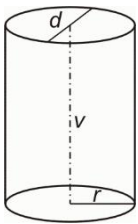
### Kvádr



$$S = 2(ab + bc + ac)$$

$$V = a \cdot b \cdot c$$

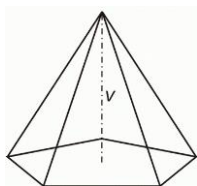
### Válec



$$S = 2\pi r^2 + 2\pi r \cdot v = 2\pi r(r + v)$$

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

### Jehlan

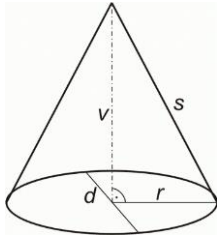


$$S = S_p + S_{pl}$$

$$V = \frac{1}{3} S_p \cdot v$$



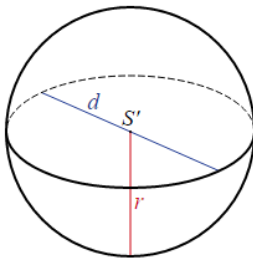
## Kužel



$$S = \pi r \cdot (r + s)$$

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

## Koule



$$S = 4\pi \cdot r^2 = \pi \cdot d^2$$

$$V = \frac{4}{3} \pi \cdot r^3 = \frac{1}{6} \pi \cdot d^3$$