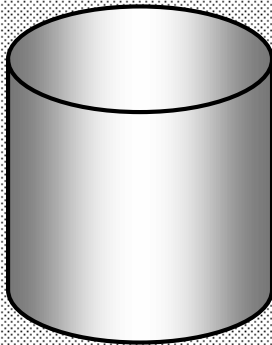


Formelsammlung

$$x + 3$$

$$\sqrt{45}$$

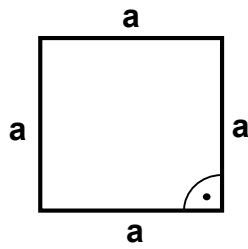


Ausgabe August 2009

Nur diese Formelsammlung darf bei der Prüfung 2010 benutzt werden.

Flächen: Flächeninhalt A und Umfang U

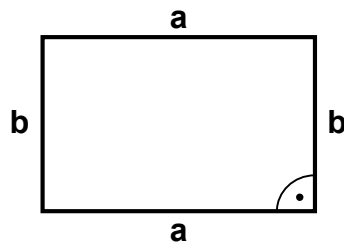
Quadrat



$$A = a^2$$

$$U = 4a$$

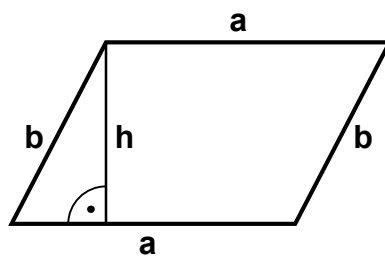
Rechteck



$$A = a \cdot b$$

$$U = 2a + 2b \\ = 2(a+b)$$

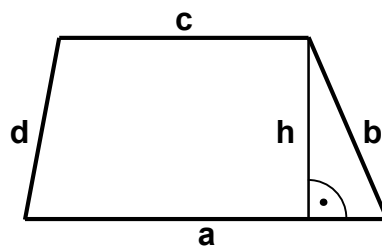
Parallelogramm



$$A = a \cdot h$$

$$U = 2a + 2b \\ = 2(a+b)$$

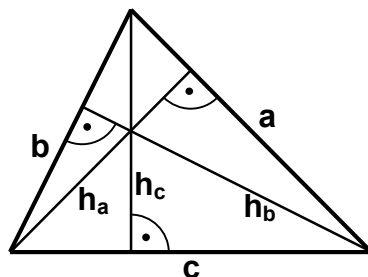
Trapez



$$A = \frac{1}{2}(a+c) \cdot h$$

$$U = a + b + c + d$$

Dreieck



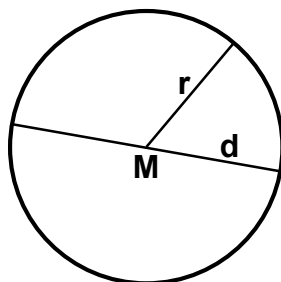
$$A = \frac{a \cdot h_a}{2}$$

$$= \frac{b \cdot h_b}{2}$$

$$= \frac{c \cdot h_c}{2}$$

$$U = a + b + c$$

Kreis



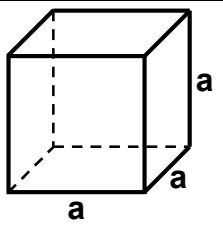
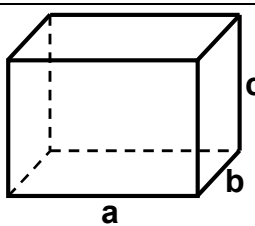
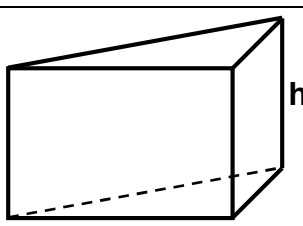
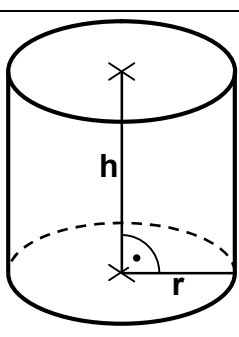
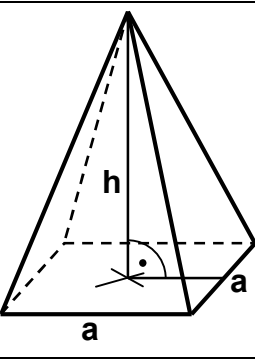
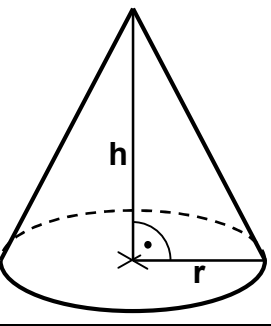
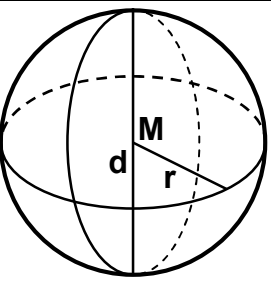
$$A = \pi r^2$$

$$= \frac{\pi}{4} d^2$$

$$U = 2\pi r$$

$$= \pi d$$

Körper: Volumen V, Oberfläche O, Grundfläche A_G, Mantelfläche M

<p><u>Würfel</u></p>		$V = a^3$ $O = 6 a^2$
<p><u>Quader</u></p>		$V = a \cdot b \cdot c$ $O = 2 a b + 2 a c + 2 b c$
<p><u>Prisma</u></p>		$V = A_G \cdot h$ $O = 2 A_G + M$
<p><u>Zylinder</u></p>		$V = A_G \cdot h$ $= \pi r^2 h$ $O = 2 A_G + M$ $= 2 \pi r (r+h)$ $M = 2 \pi r h$
<p><u>Quadratische Pyramide</u></p>		$V = \frac{1}{3} A_G \cdot h$ $= \frac{1}{3} a^2 h$
<p><u>Kegel</u></p>		$V = \frac{1}{3} A_G \cdot h$ $= \frac{1}{3} \pi r^2 h$ $M = \pi r s$
<p><u>Kugel</u></p>		$V = \frac{4}{3} \pi r^3$ $= \frac{1}{6} \pi d^3$ $O = 4 \pi r^2$ $= \pi d^2$

Quadratische Gleichungen

Allgemeine Form

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

Lösungsformel:

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

Normalform

$$x^2 + px + q = 0$$

Lösungsformel:

$$x_{1,2} = -\frac{p}{2} \pm \sqrt{\left(\frac{p}{2}\right)^2 - q}$$

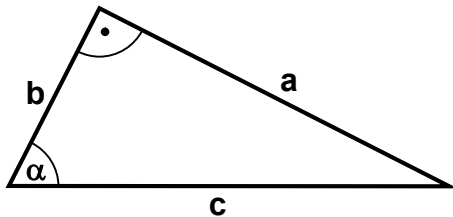
Satz des Vieta:

$$x_1 + x_2 = -p$$

$$x_1 \cdot x_2 = q$$

Berechnungen im Dreieck

Rechtwinkliges Dreieck



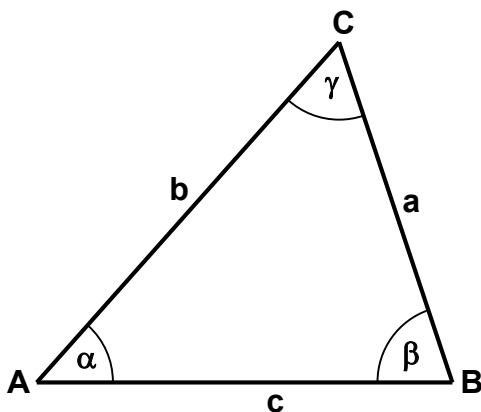
Satz des Pythagoras:

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

Winkelfunktionen:

$$\sin \alpha = \frac{a}{c} \quad \cos \alpha = \frac{b}{c} \quad \tan \alpha = \frac{a}{b}$$

Allgemeines Dreieck



Sinussatz:

$$\frac{\sin \alpha}{a} = \frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$$

Kosinussatz:

$$a^2 = b^2 + c^2 - 2bc \cos \alpha$$

$$b^2 = a^2 + c^2 - 2ac \cos \beta$$

$$c^2 = a^2 + b^2 - 2ab \cos \gamma$$

Flächeninhalt:

$$A = \frac{1}{2} bc \sin \alpha = \frac{1}{2} ac \sin \beta = \frac{1}{2} ab \sin \gamma$$

Exponentielles Wachstum

$$W_n = W_0 \cdot q^n$$

oder

$$K_n = K_0 \cdot q^n$$

$$q = 1 + \frac{p}{100} \quad (\text{Zunahme})$$

$$q = 1 - \frac{p}{100} \quad (\text{Abnahme})$$

Logarithmengesetze

Für alle $u, v \in \mathbb{R}^+$ gilt:

$$\log_a(u \cdot v) = \log_a u + \log_a v$$

$$\log_a\left(\frac{u}{v}\right) = \log_a u - \log_a v$$

$$\log_a u^k = k \cdot \log_a u; \quad k \in \mathbb{R}$$