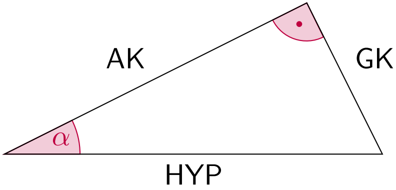
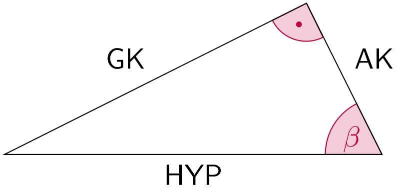
Trigonometrie

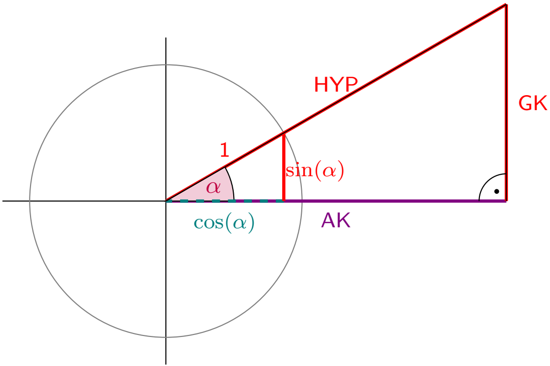
Trigonometrie im Dreieck

Carina Heiss

Rechtwinkliges Dreieck

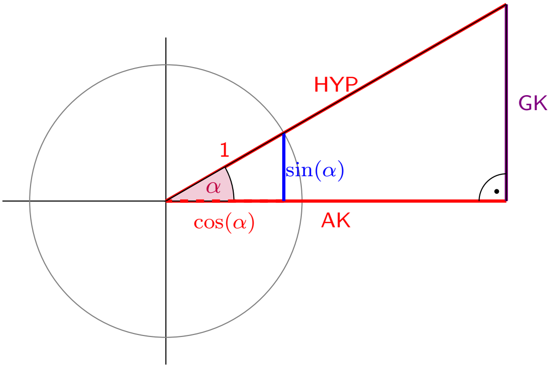






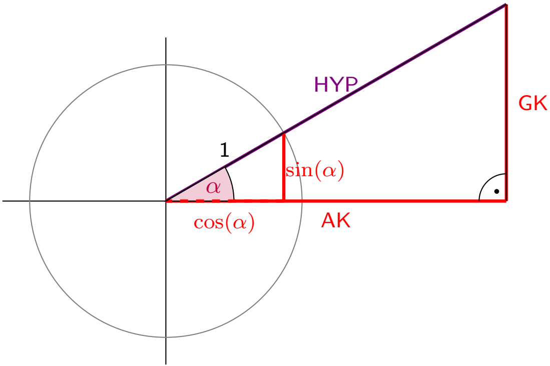
$$\frac{\text{GK}}{\text{HYP}} = \frac{\sin(\alpha)}{1}$$

$$\sin(\alpha) = \frac{\text{GK}}{\text{HYP}}$$



$$\frac{\text{AK}}{\text{HYP}} = \frac{\cos(\alpha)}{1}$$

$$\cos(\alpha) = \frac{\text{AK}}{\text{HYP}}$$



$$\frac{\mathsf{GK}}{\mathsf{AK}} = \frac{\sin(\alpha)}{\cos(\alpha)} = \tan(\alpha)$$

$$\tan(\alpha) = \frac{\mathsf{GK}}{\mathsf{AK}}$$

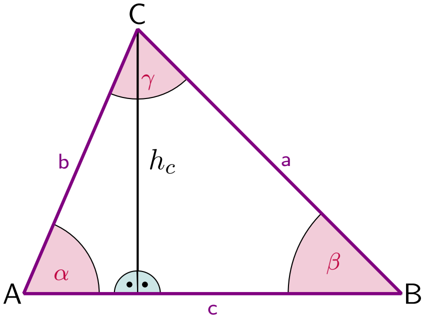
Beliebige Dreiecke - Sinussatz

Im beliebigen Dreieck ABC gilt:

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

$$\sin(\alpha) : \sin(\beta) : \sin(\gamma) = a : b : c$$

Beliebige Dreiecke - Sinussatz



$$\sin(\alpha) = \frac{h_c}{b}$$

und $\sin(\beta) = \frac{h_c}{a}$

$$\frac{\sin(\alpha)}{\sin(\beta)} = \frac{\frac{h_c}{b}}{\frac{h_c}{a}} = \frac{\cancel{h_c}}{b} \cdot \frac{a}{\cancel{h_c}} = \frac{a}{b}$$

Beliebige Dreiecke - Kosinussatz

Im beliebigen Dreieck ABC gilt:

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

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

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