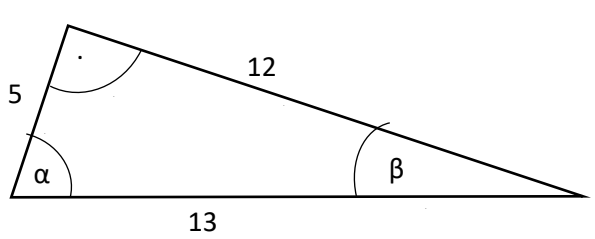
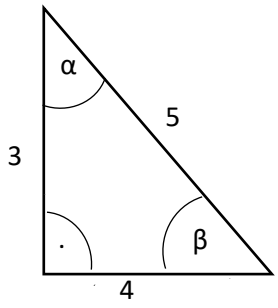
AB 1

1. Berechne in dem rechtwinkligen Dreieck sin(α), sin(β), cos(α), cos(β), tan(α) und tan(β).

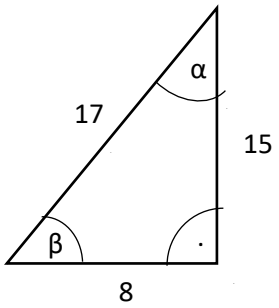
a)



b)



c)



1d) Was fällt auf? _____

2. Bestimme den Winkel.

a) $\sin(\alpha) = \frac{1}{2}$
b) $\cos(\alpha) = \frac{1}{6}$
c) $\sin(\alpha) = 0{,}4$
d) $\tan(\alpha) = 0{,}6$
e) $\cos(\alpha) = 1$
f) $\cos(\alpha) = 0{,}03$
g) $\tan(\alpha) = 0{,}1$
h) $\sin(\alpha) = 0{,}2$

3. Für welche Winkel α zwischen 0° und 360° gilt:

a) $\sin(\alpha) = 0{,}4384$
b) $\sin(\alpha) = -0{,}2588$
c) $\sin(\alpha) = 0{,}8090$
d) $\sin(\alpha) = 0{,}2924$
e) $\cos(\alpha) = 0{,}6428$
f) $\cos(\alpha) = -0{,}9848$
g) $\cos(\alpha) = 0{,}6691$
h) $\cos(\alpha) = 0{,}1219$
i) $\tan(\alpha) = 1{,}7321$
j) $\tan(\alpha) = -0{,}8693$

Beispiel:
$sin(\alpha) = -0{,}4540$
$\alpha_0 = -27°$
$\alpha_1 = 180° - (-27°) = \mathbf{207}°$
$\alpha_2 = 360° - 27° = \mathbf{333}°$

4. a) Drücke mithilfe von Kosinus aus:

   $\sin(12°)$; $\sin(27°)$; $\sin(34°)$; $\sin(48°)$; $\sin(67°)$

   b) Drücke mithilfe von Sinus aus:

   $\cos(19°)$; $\cos(33°)$; $\cos(41°)$; $\cos(58°)$; $\cos(82°)$

5. Berechne aus den gegebenen Grössen des rechtwinkligen Dreiecks ABC die übrigen.

Beispiel:

Geg.: γ = 90°; α = 50°; b= 5 cm

c: $\cos(\alpha) = \frac{b}{c} \leftrightarrow c = \frac{b}{\cos(\alpha)} = \frac{5}{\cos(50°)} = 7{,}7\ cm$

β: $\sin(\beta) = \frac{b}{c} \leftrightarrow \beta = \sin^{-1}\left(\frac{b}{c}\right) = \sin^{-1}\left(\frac{5\ cm}{7{,}7\ cm)}\right) = 40°$

a: $\tan(\alpha) = \frac{a}{b} \leftrightarrow a = b \times \tan(\alpha) = 5\ cm \times \tan(50°) = 6\ cm$

a) b = 7 cm; α = 13°; γ = 90°
b) b = 4,3 cm; β = 43°; α = 90°
c) b = 195 cm; γ = 61°; β = 90°
d) c = 20 cm; β = 32°; γ = 90°
e) b = 20,3 cm; β = 35°; γ = 90°
f) a = 60 m; b = 50m; α = 90°
g) c = 253 cm; β = 21°; γ = 90°
h) a = 42,7 m; c = 83,2 m; β = 90°
i) c = 97,5 m; b = 68,4 m; α = 90°
j) c = 342,6 m; a = 113,1 m ; β = 90°
k) a = 272 mm; c = 353 mm ; γ = 90°
l) a = 65,9 cm; b = 272,4 cm ; β = 90°
m) a = 209 m; α = 61°; γ = 90°
n) b = 15,47 m; β = 55°; α = 90°
o) c = 233 m; α = 63°; γ = 90°
p) a =1045 km; γ = 41° ; α = 90°