# Trig functions (total 6)

SOH CAH TOA

$\sin = \frac{opp}{hyp}$ $\cos = \frac{adj}{hyp}$ $\tan = \frac{opp}{adj}$ $\cot = \frac{adj}{opp}$

$\csc = \frac{hyp}{opp}$ (cosecant) $\sec = \frac{hyp}{adj}$ (Secant)

- Tan and cot are reciprocal functions $\tan = \frac{1}{\cot}$
- sin and csc are reciprocal $\sin = \frac{1}{\csc}$
- cos and sec are reciprocal $\cos = \frac{1}{\sec}$

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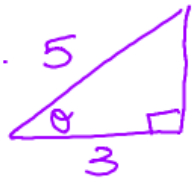
1. 


$\sin = \frac{4}{5}$ $\cos = \frac{3}{5}$ $\tan = \frac{4}{3}$

$\csc = \frac{5}{4}$ $\sec = \frac{5}{3}$ $\cot = \frac{3}{4}$

2. $\sin = \frac{8}{\sqrt{113}}$ $\cos = \frac{7}{\sqrt{113}}$ $\tan = \frac{8}{7}$

$\csc = \frac{\sqrt{113}}{8}$ $\sec = \frac{\sqrt{113}}{7}$ $\cot = \frac{7}{8}$

$\frac{8}{\sqrt{113}} \cdot \frac{\sqrt{113}}{\sqrt{113}} = \boxed{\frac{8\sqrt{113}}{113}}$

6. 


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

$6^2 + b^2 = 8^2$

$36 + b^2 = 64$

$-36 \quad -36$

$\sqrt{b^2} = \sqrt{28}$

$b = 2\sqrt{7}$

$\sin\theta = \frac{6}{8}$ $\csc = \frac{8}{6}$

$\cos\theta = \frac{2\sqrt{7}}{8}$ $\sec = \frac{8}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{4\sqrt{7}}{7}$

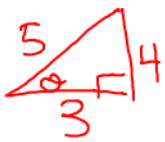
$\tan\theta = \frac{6}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$ $\cot = \frac{2\sqrt{7}}{6}$

$= \frac{6\sqrt{7}}{14}$

$= \frac{3\sqrt{7}}{7}$

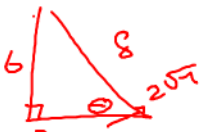
$\sqrt{28}$

$\sqrt{4 \cdot 7} = 2\sqrt{7}$

1. 


sin: 4/5 csc: 5/4
cos: 3/5 sec: 5/3
tan: 4/3 cot: 3/4

4) sin: $\frac{8}{17}$ cos $\frac{15}{17}$ tan $\frac{8}{15}$
csc: $\frac{17}{8}$ sec $\frac{17}{15}$ cot = $\frac{15}{8}$

6) 


sin = $\frac{6}{8}$ ~~cos~~: $\frac{8}{6}$
cos: $\frac{2\sqrt{7}}{8}$ sec: $\frac{8}{2\sqrt{7}}$
tan: $\frac{6}{2\sqrt{7}}$ cot: $\frac{2\sqrt{7}}{6}$

$6^2 + b^2 = 8^2$

8) $-36 \quad -36 \quad +b^2 = 64 \quad -36$

$\sqrt{b^2} = \sqrt{28}$

$b = 2\sqrt{7}$

$\frac{4}{12} = \frac{1}{3}$

$\tan = \frac{6}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{6\sqrt{7}}{14} = \frac{3\sqrt{7}}{7}$

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• Find the remaining trig functions.

#9 $\sin\theta = \frac{3}{7}$ (opp / hyp)


Pythagorean theorem

$3^2 + x^2 = 7^2$

$9 + x^2 = 49$

$x^2 = 40$

$x = \sqrt{40}$

$\boxed{x = 2\sqrt{10}}$

cos tan

csc sec cot

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