

13.8 Reciprocal Trig Functions

① $\sin \theta = \frac{\text{opp}}{\text{hyp}}$

cosecant
 $\csc \theta = \frac{1}{\sin \theta}$

OR

$$\csc \theta = \frac{\text{hyp}}{\text{opp}}$$

cosecant is the reciprocal function of sine.

(ex) Suppose $\sin \theta = \frac{8}{15}$. Find $\csc \theta$.

$$\csc \theta = \frac{15}{8} \text{ answer} \leftarrow$$

② $\cos \theta = \frac{\text{adj}}{\text{hyp}}$

Secant

$$\sec \theta = \frac{1}{\cos \theta}$$

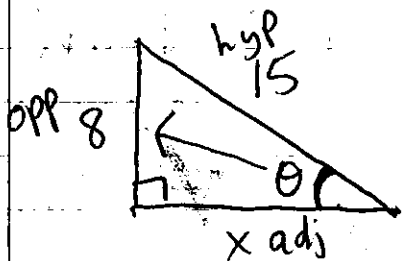
OR

$$\sec \theta = \frac{\text{hyp}}{\text{adj}}$$

Secant is the reciprocal function of Cosine.

(ex) $\sin \theta = \frac{8}{15}$ opp hyp

Find the $\sec \theta = \frac{\text{hyp}}{\text{adj}}$



$$\begin{aligned} 8^2 + x^2 &= 15^2 \\ 64 + x^2 &= 225 \\ -64 & \quad -64 \\ \hline x^2 &= 161 \\ x &= \sqrt{161} \end{aligned}$$

$$\sec \theta = \frac{15}{\sqrt{161}}$$

S O
C H
T A
A R
A cot

csc
sec
cot

(3) $\tan \theta = \frac{\text{opp}}{\text{adj}}$

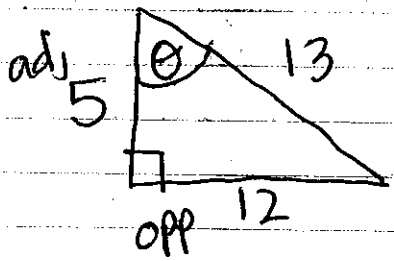
Cotangent

$\cot \theta = \frac{1}{\tan \theta}$

OR $\cot \theta = \frac{\text{adj}}{\text{opp}}$

Cotangent is the reciprocal func. of tangent.

(ex) $\cos \theta = \frac{5^{\leftarrow \text{adj}}}{13^{\leftarrow \text{hyp}}}$ Find $\cot \theta = \frac{\text{adj}}{\text{opp}}$



$$5^2 + x^2 = 13^2$$

$$25 + x^2 = 169$$

$$-25 \quad -25$$

$$\sqrt{x^2} = \sqrt{144}$$

$$x = 12$$

$\cot \theta = \frac{5}{12}$

- triples =
- | | | |
|------------|------------|-----------|
| 3, 4, 5 | 5, 12, 13 | 7, 24, 25 |
| 6, 8, 10 | 10, 24, 26 | |
| 9, 12, 15 | | |
| 12, 16, 20 | | |

Calculator. Round to hundredth.

Find $\cot 55^\circ$.

mode -
degrees

calculator

$$1 \div \tan(55)$$

= 0.70

cot is NOT = $\cot 55^\circ \neq \tan^{-1}(55)$ to inverse tan

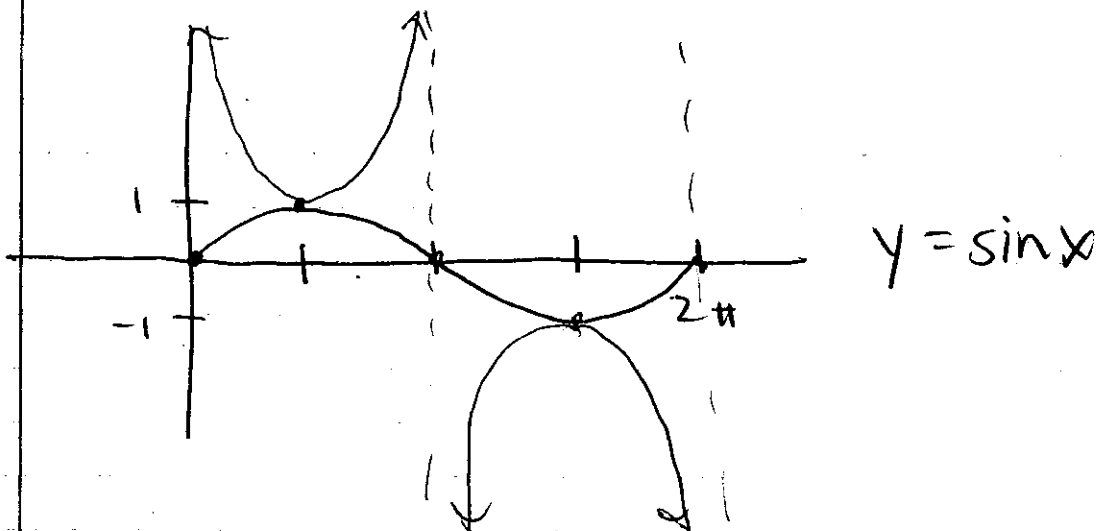
(ex) Find $\csc 60^\circ = \frac{1}{\sin(60^\circ)} = 1.15$

(ex) Find $\sec\left(\frac{\pi}{3}\right) = \frac{1}{\cos\left(\frac{\pi}{3}\right)} = 2$

* change mode
to radians

(ex) $\csc(-1.5) = \frac{1}{\sin(-1.5)} = -1.00$

(ex) $\cot \pi = \text{undefined}$



p. 766-767 (2-28E, 42-45,
50-54)