

4-1: RIGHT TRIANGLE TRIGONOMETRY

Precalculus
Mr. Gallo

RIGHT TRIANGLE TRIGONOMETRIC FUNCTIONS

Six Trigonometric Functions

$$\text{sine } (\theta) = \sin \theta = \frac{\text{opp}}{\text{hyp}}$$

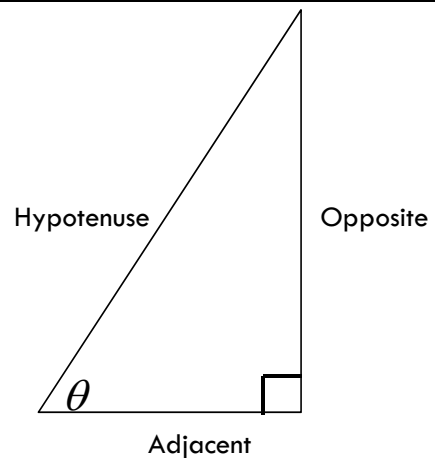
$$\text{cosecant } (\theta) = \csc \theta = \frac{\text{hyp}}{\text{opp}}$$

$$\text{cosine } (\theta) = \cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\text{secant } (\theta) = \sec \theta = \frac{\text{hyp}}{\text{adj}}$$

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

$$\text{cotangent } (\theta) = \cot \theta = \frac{\text{adj}}{\text{opp}}$$



▪ Reciprocal Trigonometric Functions

- Cosecant, secant and cotangent
- Ratios are reciprocals of sine, cosine and tangent respectively

RIGHT TRIANGLE TRIGONOMETRIC FUNCTIONS

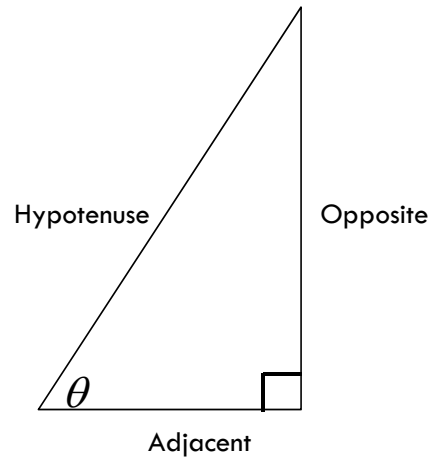
Inverse Trigonometric Functions

- Used to find the measure of an acute angle

If $\sin \theta = x$, then $\sin^{-1} x = \theta$

If $\cos \theta = x$, then $\cos^{-1} x = \theta$

If $\tan \theta = x$, then $\tan^{-1} x = \theta$



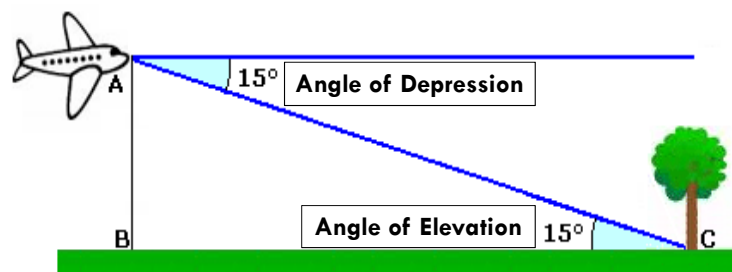
ANGLES OF ELEVATION AND DEPRESSION

Angle of Elevation

- The angle above horizontal that an observer must look to see an object that is higher than the observer. It is congruent to the **angle of depression**.

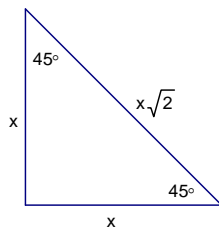
Angle of Depression

- The angle below horizontal that an observer must look to see an object that is lower than the observer. It is congruent to the **angle of elevation**.

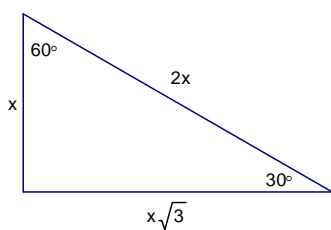


SPECIAL RIGHT TRIANGLES

$45^\circ - 45^\circ - 90^\circ$



$30^\circ - 60^\circ - 90^\circ$



θ	30°	45°	60°
$\sin \theta$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\cos \theta$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
$\tan \theta$	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$
$\csc \theta$	2	$\sqrt{2}$	$\frac{2\sqrt{3}}{3}$
$\sec \theta$	$\frac{2\sqrt{3}}{3}$	$\sqrt{2}$	2
$\cot \theta$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$

Homework: p.227 #1, 5, 11, 15, 21, 23, 27, 30, 31, 35, 39, 40, 45, 74