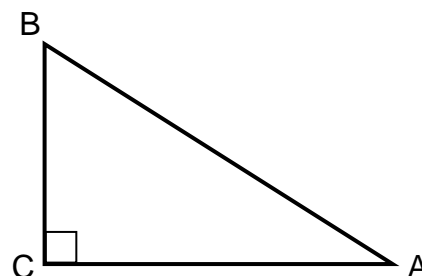# Notes: **SOLVING RIGHT TRIANGLES**

Content Objective*: I will be able to use trigonometric ratios to find side lengths and angles of right triangles.*

INVERSE TRIGONOMETRIC RATIOS:

Let $\angle A$ be an acute angle:

- Inverse Sine: If sin A = y, then $\sin^{-1}$ y = m$\angle$A

- Inverse Cosine: If cos A = z, then $\cos^{-1}$z = m$\angle$A

- Inverse Tangent: If tan A = x, then $\tan^{-1}$z = m$\angle$A

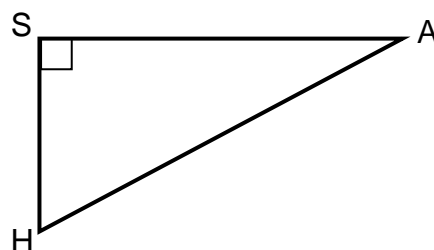*Use the right triangle above to fill in the missing lengths to complete the inverse trigonometric ratios.*

$$\sin^{-1} \frac{BC}{\boxed{}} = m\angle A \qquad \cos^{-1} \frac{AC}{\boxed{}} = m\angle A \qquad \tan^{-1} \frac{BC}{\boxed{}} = m\angle A$$

EXAMPLE 1: *Set up an equation to solve for the measure of $\angle A$*

m$\angle$A = $\sin^{-1}$_____

m$\angle$A = $\tan^{-1}$_____

m$\angle$A = $\cos^{-1}$_____

QUICK CHECK: *Set up an equation to solve for the measure of $\angle H$*

m$\angle$H = $\sin^{-1}$_____

m$\angle$H = $\tan^{-1}$_____

m$\angle$H = $\cos^{-1}$_____
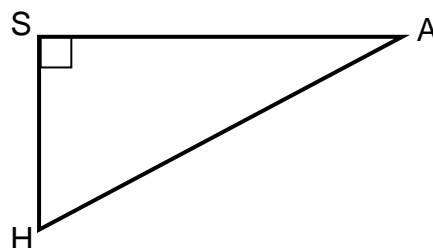
EXAMPLE 2: *Set up an equation to solve for the measure of ∠D and ∠F; round to the nearest degree.*

D
29
20
E   21   F

m∠D ≈ _____°

m∠F ≈ _____°
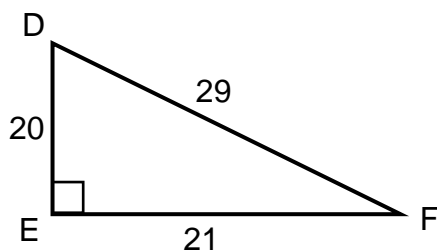
QUICK CHECK: *Set up an equation to solve for the measure of ∠A, and ∠B; round to the nearest degree.*

A
13
5
C   12   B

m∠A ≈ _____°

m∠B ≈ _____°
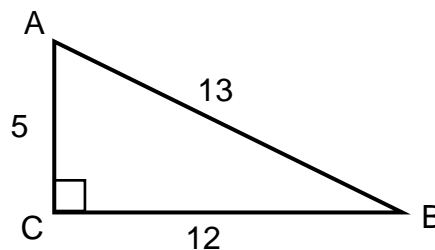
EXAMPLE 3: *Find the missing measurements of the right triangle, round answers to the nearest tenth.*

G
15
L   55°   J

m∠G = _____

GJ ≈ _____

LJ ≈ _____
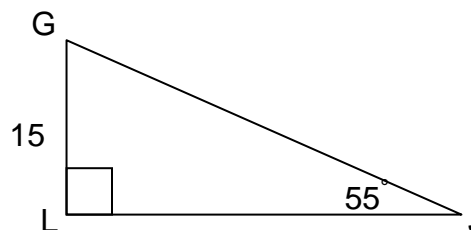
QUICK CHECK: *Find the missing measurements of the right triangle, round answers to the nearest tenth.*

C
B 22°   8   A

AC ≈ _____

BC ≈ _____

m∠A= _____