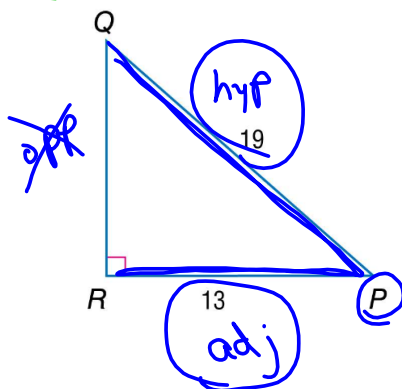


**Example 4** Find Angle Measures Using Inverse Trigonometric Ratios

★ Use a calculator to find the measure of  $\angle P$  to the nearest tenth.

①



~~SOA~~ CAH ~~TOA~~

$$\cos P = \frac{\text{adj}}{\text{hyp}}$$

$$\cos P = \frac{13}{19}$$

$$P = \cos^{-1}\left(\frac{13}{19}\right)$$

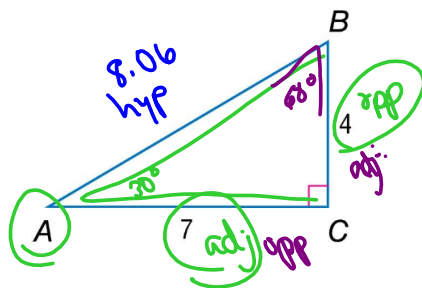
$$P = \underline{46.8^\circ}$$

KEYSTROKES: **2nd** [COS] ( 13 ÷ 19 ) **ENTER** 46.82644889

**Example 5** Solve a Right Triangle

Solve the right triangle. Round side measures to the nearest hundredth and angle measures to the nearest degree.

⑤



$$AB = \sqrt{7^2 + 4^2}$$

$$= \sqrt{49 + 16}$$

$$AB = \sqrt{65}$$

$$AB \approx 8.06$$

SIA OIA TOA

$$\tan A = \frac{4}{7}$$

$$A = \tan^{-1}\left(\frac{4}{7}\right)$$

$$A \approx 30^\circ$$

$$B = 90 - 30 \quad B \approx 60$$

$$\tan B = \frac{7}{4}$$

$$B = \tan^{-1}\left(\frac{7}{4}\right)$$

$$B \approx 60^\circ$$

Now do worksheet:

"HW4W 4 Find the Missing Angle (or side)"

Finish HW4V wk p 2-3-4 due Thur May 7  
HW4 p 60-64 due Fri May 8

**Example 1**

**Guided Practice**

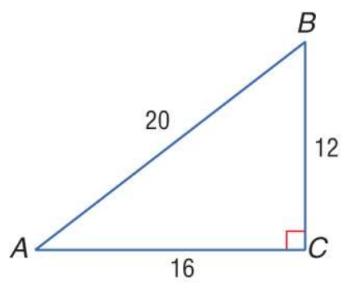
**A.** Find  $\sin A$ .

**A.**  $\frac{3}{4}$

**B.**  $\frac{3}{5}$

**C.**  $\frac{4}{5}$

**D.**  $\frac{4}{3}$



**Example 1**

**Guided Practice**

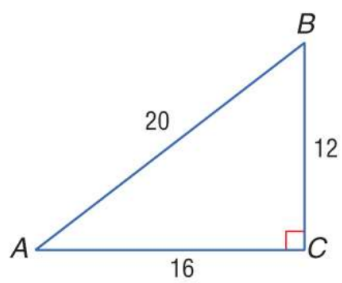
**B. Find  $\cos A$ .**

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



**Example 1**

**Guided Practice**

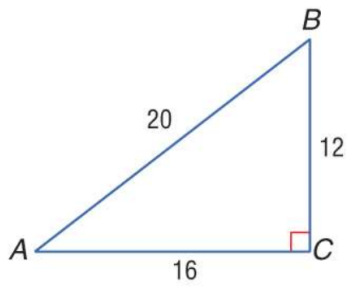
**C.** Find  $\tan A$ .

**A.**  $\frac{3}{4}$

**B.**  $\frac{3}{5}$

**C.**  $\frac{4}{5}$

**D.**  $\frac{4}{3}$



**Example 1**

**Guided Practice**

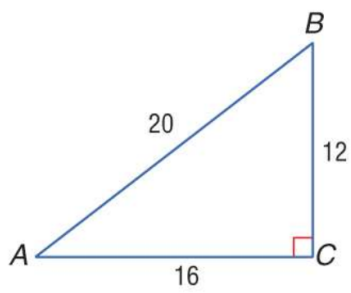
**D. Find  $\sin B$ .**

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



**Example 1**

**Guided Practice**

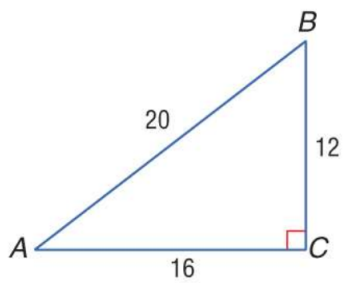
**E.** Find  $\cos B$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$





## Example 1

## Guided Practice

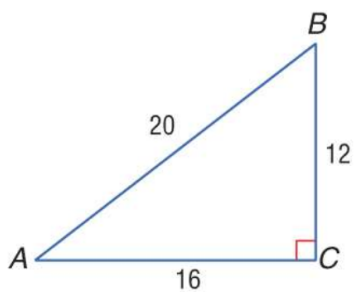
F. Find  $\tan B$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



**Example 2**

**Guided Practice**

Use a special right triangle to express the tangent of  $60^\circ$  as a fraction and as a decimal to the nearest hundredth.

- A.  $\frac{1}{2}$  or 0.50
- B.  $\frac{\sqrt{3}}{2}$  or 0.87
- C.  $\frac{\sqrt{3}}{1}$  or 1.73
- D.  $\frac{1}{\sqrt{3}}$  or 0.58

## Real-World Example 3

## Guided Practice

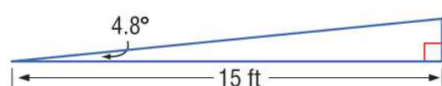
**CONSTRUCTION** The bottom of a handicap ramp is 15 feet from the entrance of a building. If the angle of the ramp is about  $4.8^\circ$ , about how high does the ramp rise off the ground to the nearest inch?

A. 1 in.

B. 11 in.

C. 16 in.

D. 15 in.



**Example 4**

**Guided Practice**

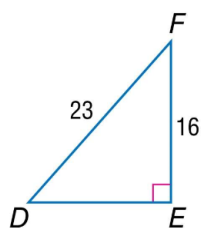
Use a calculator to find the measure of  $\angle D$  to the nearest tenth.

A.  $44.1^\circ$

B.  $48.3^\circ$

C.  $55.4^\circ$

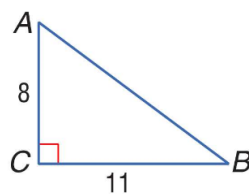
D.  $57.2^\circ$



**Example 5****Guided Practice**

Solve the right triangle. Round side measures to the nearest tenth and angle measures to the nearest degree.

- A.  $m\angle A = 36^\circ$ ,  $m\angle B = 54^\circ$ ,  
 $AB = 13.6$
- B.  $m\angle A = 54^\circ$ ,  $m\angle B = 36^\circ$ ,  
 $AB = 13.6$
- C.  $m\angle A = 36^\circ$ ,  $m\angle B = 54^\circ$ ,  
 $AB = 16.3$
- D.  $m\angle A = 54^\circ$ ,  $m\angle B = 36^\circ$ ,  
 $AB = 16.3$



## Example 1

## Guided Practice

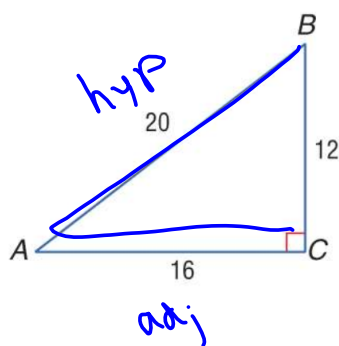
A. Find  $\sin A$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$

SOH CAH TOA

$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin A = \frac{12}{20} \div 4$$
$$= \frac{3}{5}$$

key ↓

## Example 1

## Guided Practice

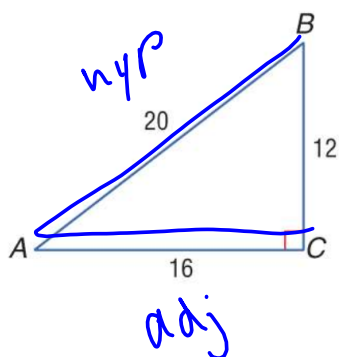
B. Find  $\cos A$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



SOHCAHTOA

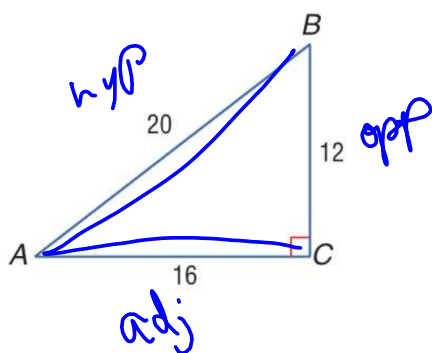
$$\begin{aligned}\cos A &= \frac{\text{adj}}{\text{hyp}} \\ \cos A &= \frac{16}{20} \\ &= \frac{4}{5}\end{aligned}$$

## Example 1

## Guided Practice

C. Find  $\tan A$ .

- A.  $\frac{3}{4}$
- B.  $\frac{3}{5}$
- C.  $\frac{4}{5}$
- D.  $\frac{4}{3}$



SOH CA H TO A

$$\tan A = \frac{\text{opp}}{\text{adj}}$$
$$\tan A = \frac{12}{16}$$
$$= \frac{3}{4}$$



## Example 1

## Guided Practice

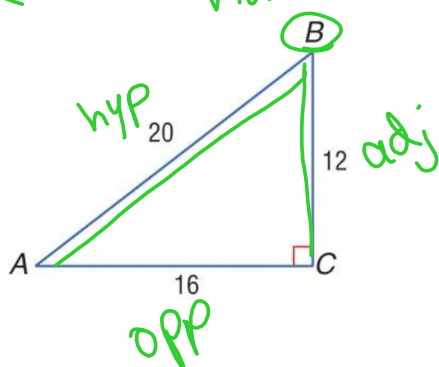
D. Find  $\sin B$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



SOH CAH TOA

$$\sin B = \frac{\text{opp}}{\text{hYP}}$$

$$\sin B = \frac{16}{20}$$
$$= \frac{4}{5}$$

## Example 1

## Guided Practice

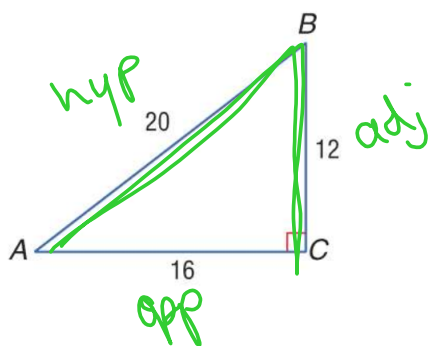
E. Find  $\cos B$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$

SOH CAH TOA

$$\cos B = \frac{\text{adj}}{\text{hyp}}$$

$$= \frac{12}{20}$$

$$\cos B = \frac{3}{5}$$

## Example 1

## Guided Practice

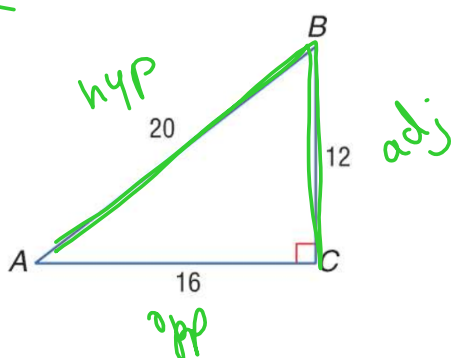
F. Find  $\tan B$ .

A.  $\frac{3}{4}$

B.  $\frac{3}{5}$

C.  $\frac{4}{5}$

D.  $\frac{4}{3}$



SOH CAH TOA

$$\tan B = \frac{\text{opp}}{\text{adj}}$$

$$\tan B = \frac{16}{12}$$

$$\tan B = \frac{4}{3}$$

## Example 2

## Guided Practice

Use a special right triangle to express the tangent of  $60^\circ$  as a fraction and as a decimal to the nearest hundredth.

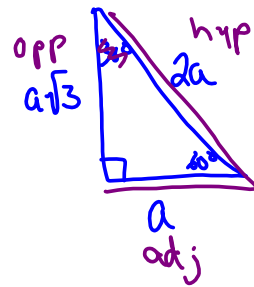
- A.  $\frac{1}{2}$  or 0.50
- B.  $\frac{\sqrt{3}}{2}$  or 0.87
- C.  $\frac{\sqrt{3}}{1}$  or 1.73**
- D.  $\frac{1}{\sqrt{3}}$  or 0.58

SOH CAH TOA

$$\tan 60^\circ = \frac{\text{opp}}{\text{adj}}$$

$$\tan 60^\circ = \frac{\sqrt{3}}{1}$$

$$\tan 60^\circ = \frac{\sqrt{3}}{1} \text{ or } \sqrt{3} \approx 1.73$$



## Real-World Example 3

## Guided Practice

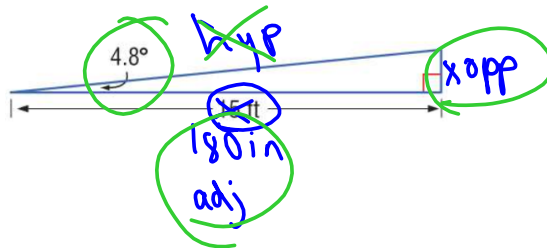
**CONSTRUCTION** The bottom of a handicap ramp is 15 feet from the entrance of a building. If the angle of the ramp is about  $4.8^\circ$ , about how high does the ramp rise off the ground to the nearest inch?

A. 1 in.

B. 11 in.

C. 16 in.

D. 15 in.



$$15\text{ft} = 180\text{ in}$$

$$15\text{ft} \cdot \frac{12\text{in}}{1\text{ft}} = 180\text{in}$$

SIN ~~CAN~~ ~~TOA~~

$$\sin 4.8^\circ = \frac{x}{180}$$

$$1x = 180 \sin 4.8^\circ$$

$$x \approx 15\text{in}$$

## Example 4

## Guided Practice

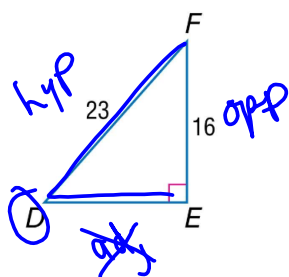
Use a calculator to find the measure of  $\angle D$  to the nearest tenth.

A.  $44.1^\circ$

B.  $48.3^\circ$

C.  $55.4^\circ$

D.  $57.2^\circ$



SOH ~~CAH~~ TOA

$$\sin D = \frac{16}{23}$$

$$D = \sin^{-1}\left(\frac{16}{23}\right)$$

$$D \approx 44.1^\circ$$

## Example 5

## Guided Practice

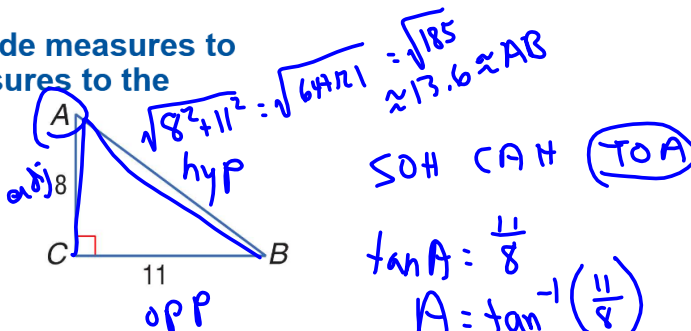
Solve the right triangle. Round side measures to the nearest tenth and angle measures to the nearest degree.

A.  $m\angle A = 36^\circ$ ,  $m\angle B = 54^\circ$ ,  
 $AB = 13.6$

B.  $m\angle A = 54^\circ$ ,  $m\angle B = 36^\circ$ ,  
 $AB = 13.6$

C.  $m\angle A = 36^\circ$ ,  $m\angle B = 54^\circ$ ,  
 $AB = 16.3$

D.  $m\angle A = 54^\circ$ ,  $m\angle B = 36^\circ$ ,  
 $AB = 16.3$



here are 2 ways to find B

$B = 90 - 54 = 36^\circ$

or  $\tan B = \frac{8}{11}$   
 $B = \tan^{-1}\left(\frac{8}{11}\right) \approx 36^\circ$

TOC **8.4 Trigonometry**

EQ: Can you find trigonometric ratios and use them to find side lengths and angle measures in right triangles?

Write 3 Questions for this section on the left page

1. How are you doing?
- Write answer next to the Summary
- 1: I don't understand the material.
  - 2: I understand a little.
  - 3: I understand this material.
  - 4: I could teach this to someone.

Summary: At least 3 sentences...

Write this now.