SOHCAHTOA

$$\text{Sin}A = \frac{\text{leg opposite } \angle A}{\text{hypotenuse}}$$

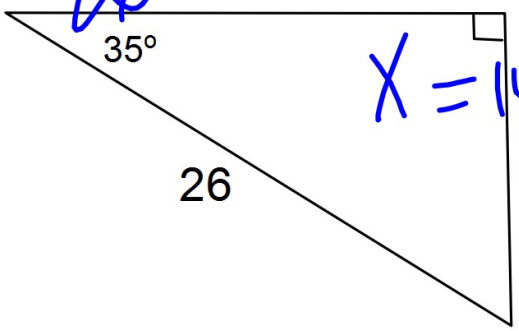
$$\text{Cos}A = \frac{\text{leg adjacent to } \angle A}{\text{hypotenuse}}$$

$$\text{Tan}A = \frac{\text{Leg Opposite } \angle A}{\text{Leg Adjacent to } \angle A}$$

Bellwork Tuesday, March 26th, 2019

Find the value of x to the nearest hundredth.

1.

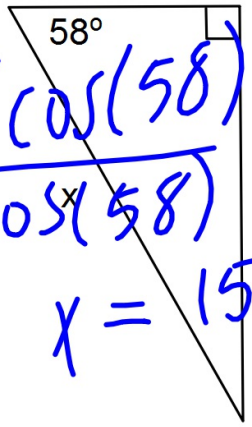


$\sin(35) = \frac{x}{26} \cdot 26$

26

$x = 14.91$

2.

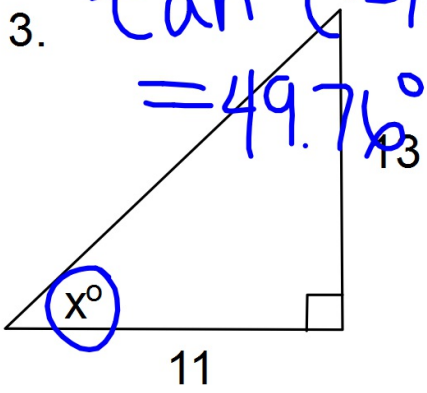


$\cos(58) = \frac{8}{x}$

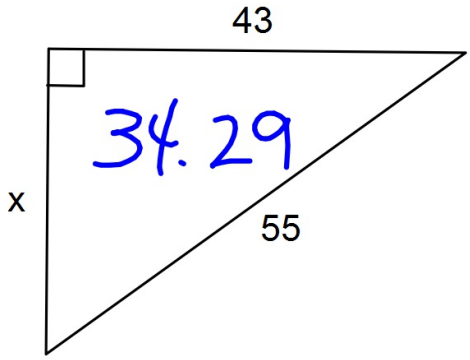
$\frac{x\cos(58)}{\cos(58)} = \frac{8}{\cos(58)}$

$x = 15.10$

3. $\tan^{-1}(13/11)$
$= 49.76°$

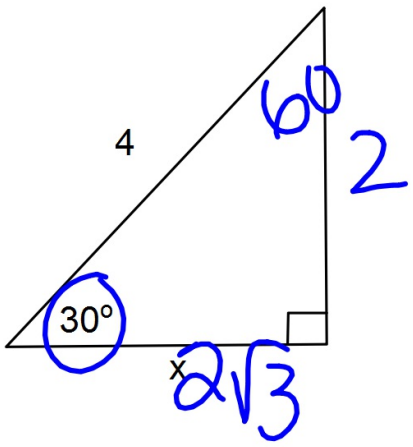


4.



Find the exact value of each missing side.

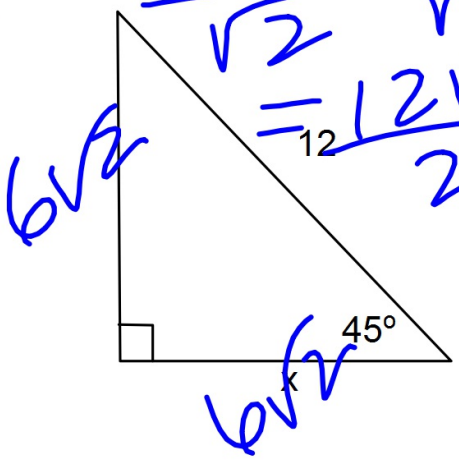
5.



6.

$\frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{12\sqrt{2}}{2}$

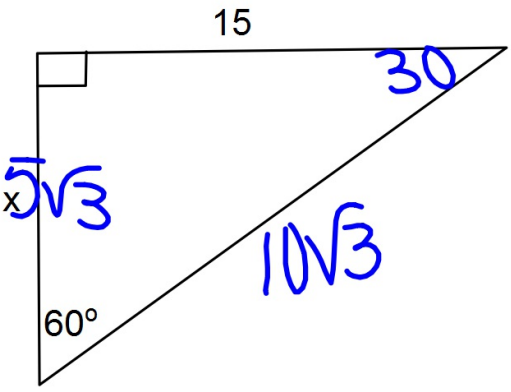


Find the exact value of the missing side.

$\frac{15}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{15\sqrt{3}}{3}$

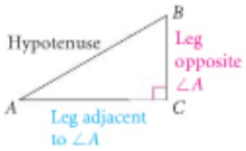
$= 5\sqrt{3}$



Geometry 8-4: Sine and Cosine Ratios

Objective 1: I can use sine and cosine ratios to find missing sides in right triangles.

The tangent ratio, as we saw in 8-3, involves both legs of a right triangle. The sine and cosine ratios involve one leg and the hypotenuse.



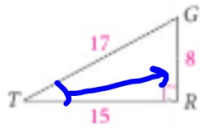
sine $\angle A$ = opp leg / hyp

cosine $\angle A$ = Adj / hyp

These equations can be abbreviated:

sin A = $\frac{opp}{hyp}$ cos A = $\frac{adj}{hyp}$

Example 1: Writing sine and cosine ratios.
Use the triangle below to write each ratio.



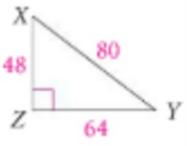
a) $\sin T = \frac{8}{17}$ b) $\cos T = \frac{15}{17}$ c) $\sin G = \frac{15}{17}$ d) $\cos G = \frac{8}{17}$

QC1: Use the triangle at the right for parts (a) and (b).

(a) Write the sine and cosine ratios for $\angle X$ and $\angle Y$.

$\sin\angle X \frac{64}{80}$ $\sin\angle Y \frac{48}{80}$

$\cos\angle X \frac{48}{80}$ $\cos\angle Y \frac{64}{80}$



(b) When does $\sin X = \cos Y$? Explain.

when they are comp.

Example 2: Use a sine or cosine ratio to find the missing side of each right triangle.

A)

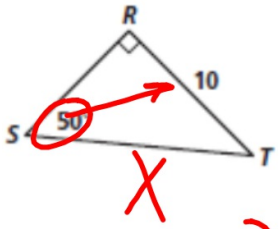
$14^2 = 4^2$

$X = 6\sqrt{5}$

180

36.5

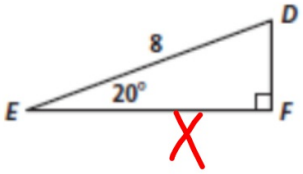
B)



$\sin(50) = \frac{10}{X}$

$X = \frac{10}{\sin 50} = 13.05$

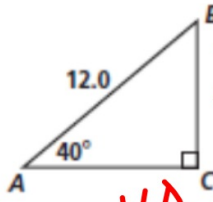
C)



$\cos(20) = \frac{X}{8}$

$X = 7.52$

D)



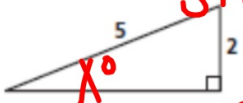
$\sin 40 = \frac{X}{12}$

$X = 7.71$

Objective 2: I can use sine and cosine ratios to find missing angles in right triangles.

If you know leg lengths for a right triangle, you can find a sine or cosine ratio for each acute angle. Conversely, if you know the sine or cosine ratio for an angle, you can use inverse sine or inverse cos

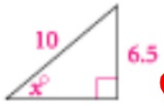
Example 3: Find the given angle to the nearest degree.

A) 

$\sin^{-1}(2/5)$

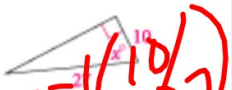
23.58

$=24°$

B) 

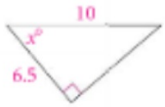
$\sin^{-1}(6.5/10)$

$=41°$

C) 

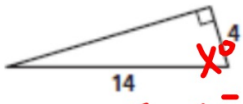
$\cos^{-1}(10/27)$

$=68°$

D) 

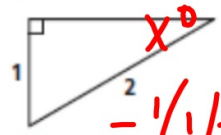
$\cos^{-1}(6.5/10)$

$=49°$

E) 

$\cos^{-1}(4/14)$

$=73°$

F) 

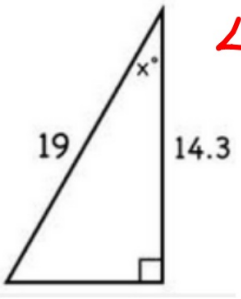
$\sin^{-1}(1/2)$

30

Mixed Practice:

Use a tangent, sine, or cosine ratio to find the missing side or angle in each right triangle below.

A) Find $m\angle X$

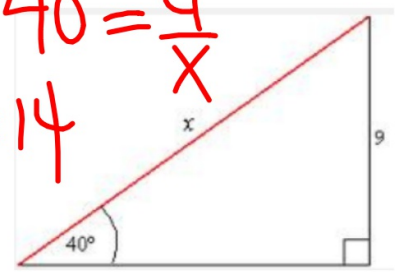


41°

B) Find x.

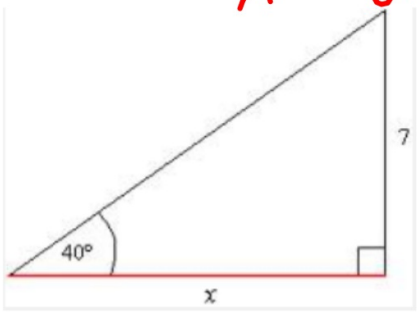
$\sin 40 = \frac{9}{x}$

$x = 14$

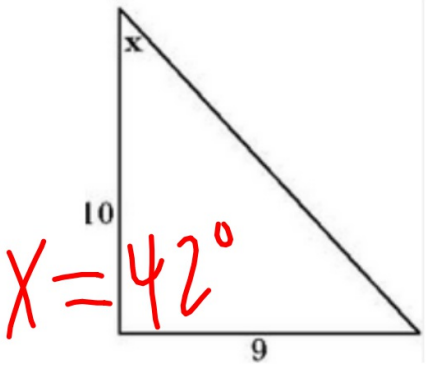


C) Find x.

$x = 8.34$



D)



$x = 42°$

Hwk #16 Sec 8-4

Pages 441

Problems: 3-7, 10-12, 21

R.1
R.8