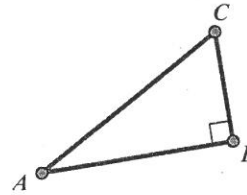


Key  
no work!

The Sine Ratio (sin)	The Cosine Ratio (cos)	The Tangent Ratio (tan)
$\sin \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$	$\cos \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$	$\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$

1. Match the following.

- a) 5 Opposite Leg to  $\angle A$
- b) 8 Sine Ratio of  $\angle C$
- c) 3 Opposite Angle to  $\overline{AB}$
- d) 6 The Hypotenuse
- e) 4 Adjacent Leg to  $\angle A$
- f) 10 Tangent Ratio of  $\angle C$
- g) 3 Reference angle if  $\frac{BC}{AC}$  is the Cosine Ratio.
- h) 5 Adjacent Leg to  $\angle C$
- i) 8 Cosine Ratio of  $\angle A$
- j) 6 The Longest Side
- k) 1 Reference angle if  $\frac{BC}{AC}$  is the Sine Ratio.



- 1.  $\angle A$
- 2.  $\angle B$
- 3.  $\angle C$
- 4.  $\overline{AB}$
- 5.  $\overline{BC}$
- 6.  $\overline{AC}$
- 7.  $\frac{BC}{AC}$
- 8.  $\frac{AB}{AC}$
- 9.  $\frac{BC}{AB}$
- 10.  $\frac{AB}{BC}$

2. Label the sides of the triangle using the reference angle -- (O) for Opposite, (A) for Adjacent and (H) for Hypotenuse. After you have labeled the triangle, then choose which trigonometric ratio that you would use to solve for the missing info.

a)   
 SIN  COS  TAN

b)   
 SIN  COS  TAN

c)   
 SIN  COS  TAN

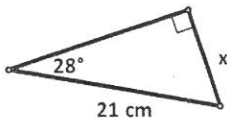
d)   
 SIN  COS  TAN

e)   
 SIN  COS  TAN

f)   
 SIN  COS  TAN

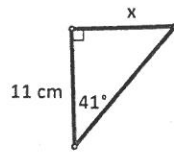
3. Solve for the side  $x$ . (Round all final answers to 2 decimal places)

a)



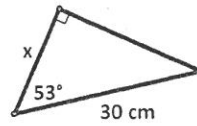
$x \approx \underline{9.86}$

b)



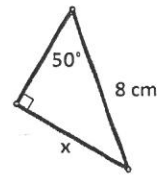
$x \approx \underline{9.56}$

c)



$x \approx \underline{18.05}$

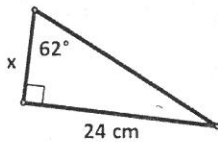
d)



$x \approx \underline{6.13}$

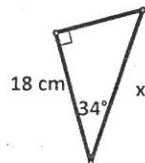
4. Solve for the side  $x$ . (Round all final answers to 2 decimal places)

a)



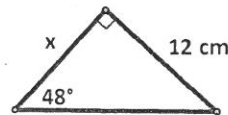
$x \approx \underline{12.76}$

b)



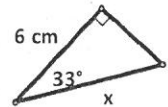
$x \approx \underline{21.71}$

c)



$x \approx \underline{10.80}$

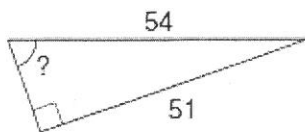
d)



$x \approx \underline{7.15}$

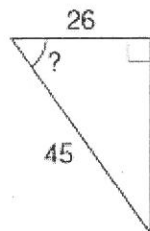
5. Solve for the missing information. (Round all final answers to 2 decimal places)

a)



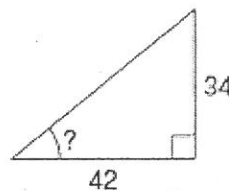
$x \approx \underline{71^\circ}$

b)



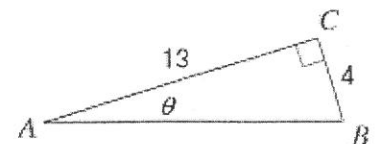
$x \approx \underline{55^\circ}$

c)



$x \approx \underline{39^\circ}$

d)

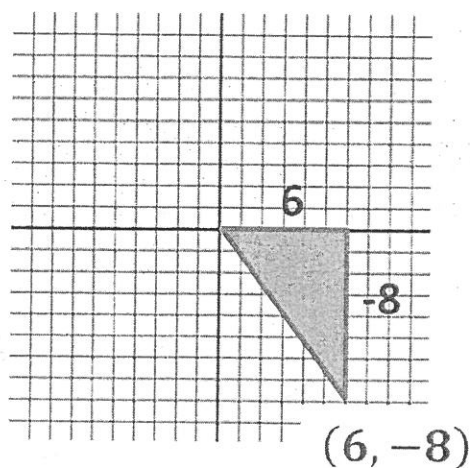


$x \approx \underline{17^\circ}$

The Cosecant Ratio (csc)	The Secant Ratio (sec)	The Cotangent Ratio (cot)
$\text{csc } \theta = \frac{\text{Hypotenuse}}{\text{Opposite}}$	$\text{sec } \theta = \frac{\text{Hypotenuse}}{\text{Adjacent}}$	$\text{cot } \theta = \frac{\text{Adjacent}}{\text{Opposite}}$

**Key concept:** Find the exact values of the 6 trig functions given the ordered pair.

(6, -8)



### Process

1. Draw the ordered pair (right 6, down 8)
2. Draw a line from the origin to the ordered pair in order to complete your triangle
3. Find the value of  $c$  using the Pythagorean theorem  $a^2 + b^2 = c^2$
4. Find the exact values of the 6 trig functions

$$6^2 + (-8)^2 = c^2$$

$$36 + 64 = c^2$$

$$100 = c^2$$

$$c = 10$$

$$\sin \theta = -\frac{8}{10} = -\frac{4}{5}$$

$$\text{csc } \theta = -\frac{10}{8} = -\frac{5}{4}$$

$$\cos \theta = \frac{6}{10} = \frac{3}{5}$$

$$\text{sec } \theta = \frac{10}{6} = \frac{5}{3}$$

$$\tan \theta = -\frac{8}{6} = -\frac{4}{3}$$

$$\text{cot } \theta = -\frac{6}{8} = -\frac{3}{4}$$

**Practice:** Find the exact values of the 6 trig functions given the ordered pair.

1. (-3,4)

$$\sin \theta = \frac{4}{5}$$

$$\text{csc } \theta = \frac{5}{4}$$

$$\cos \theta = -\frac{3}{5}$$

$$\text{sec } \theta = -\frac{5}{3}$$

$$\tan \theta = -\frac{4}{3}$$

$$\text{cot } \theta = -\frac{3}{4}$$

2. (-15, -36)

$$\sin \theta = -36/39$$

$$\cos \theta = -15/39$$

$$\tan \theta = 36/15$$

$$\csc \theta = -39/36$$

$$\sec \theta = -39/15$$

$$\cot \theta = 15/36$$

3. (16, 30)

$$\sin \theta = 15/17$$

$$\cos \theta = 8/17$$

$$\tan \theta = 15/8$$

$$\csc \theta = 17/15$$

$$\sec \theta = 17/8$$

$$\cot \theta = 8/15$$

4. (9, -40)

$$\sin \theta = -40/41$$

$$\cos \theta = 9/41$$

$$\tan \theta = -40/9$$

$$\csc \theta = -41/40$$

$$\sec \theta = 41/9$$

$$\cot \theta = -9/40$$

5. (-8, 2)

$$\sin \theta = \frac{1}{\sqrt{17}}$$

$$\cos \theta = -4/\sqrt{17}$$

$$\tan \theta = -1/4$$

$$\csc \theta = \sqrt{17}$$

$$\sec \theta = -\sqrt{17}/4$$

$$\cot \theta = -4$$