

PC 5-3

To determine all trig ratios for a given angle, we need to determine which quadrant the angle is in. If **both given trig ratios are positive**, then θ is always in Quadrant I. If **either ratio is negative**, then the angle could be in any of the other three quadrants. Reciprocal pair functions (sin & csc, cos & sec, tan & cot) always have the same sign, so we don't need to consider them individually.

1. Determine which quadrant results from each of the following combinations of signs.

	sin/csc	cos/sec	Quadrant
a.	+	-	
b.	-	+	
c.	-	-	

	sin/csc	tan/cot	Quadrant
d.	+	-	
e.	-	+	
f.	-	-	

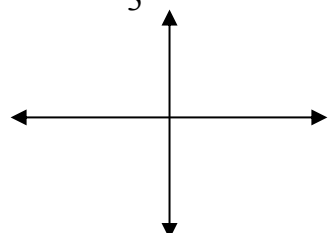
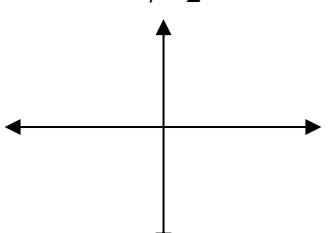
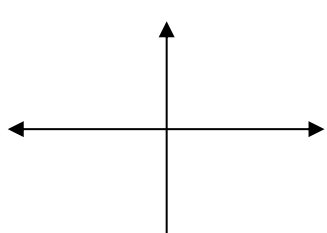
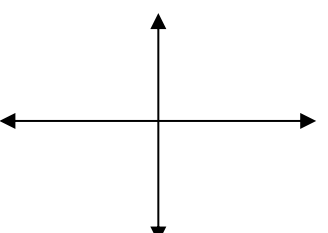
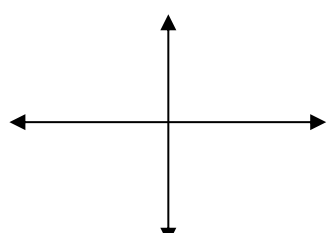
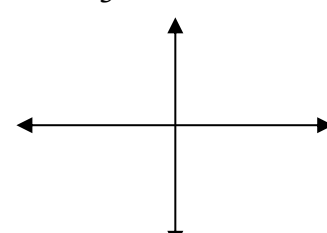
	cos/sec	tan/cot	Quadrant
g.	+	-	
h.	-	+	
i.	-	-	

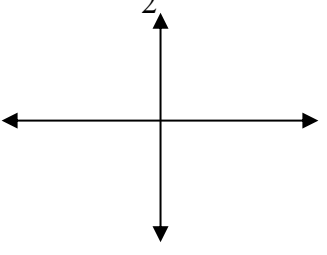
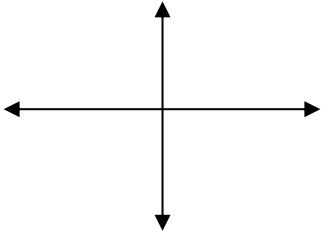
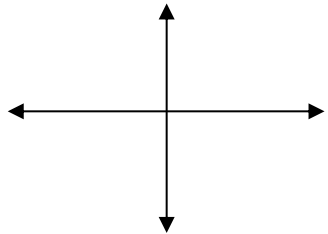
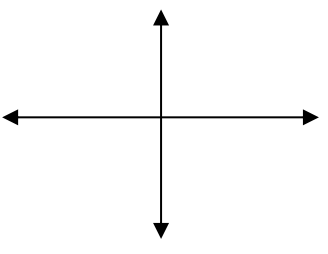
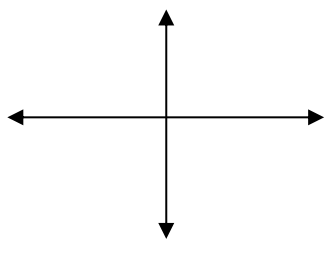
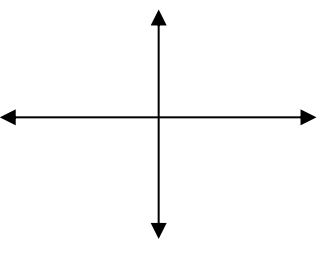
The quadrant can be specified in a number of ways:

- A. Stating the sign of another trig ratio, as in the above tables
- B. Explicitly stating the quadrant (" θ is in quadrant IV")
- C. Stating the angle measure of θ as an inequality ($\frac{3\pi}{2} < \theta < 2\pi$)
- D. Giving a point on the terminal side of θ ("Point $P(-1, -7)$ is on the terminal side of θ ")

(A 5th method, using an inverse trig function, will be covered toward the end of this chapter).

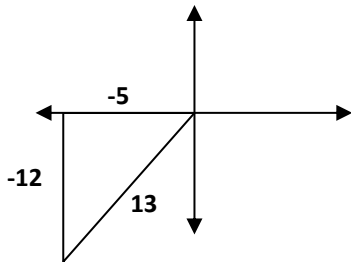
2. Draw and label the reference triangle using the given information.

<p>a) $\sin \theta = \frac{2}{3}$, θ is in Quad I</p> 	<p>b) $\cos \theta = -\frac{3}{7}$, $\frac{\pi}{2} < \theta < \pi$</p> 	<p>c) $\tan \theta = \frac{5}{12}$, $\sin \theta < 0$</p> 
<p>d) Point $P(5, -2)$ is on the terminal side of θ</p> 	<p>e) $\sec \theta = -3$, $\tan \theta < 0$</p> 	<p>f) $\csc \theta = \frac{5}{3}$, $\cos \theta > 0$</p> 

<p>g) $\cot \theta = -\frac{7}{2}$, θ is in Quad IV</p> 	<p>h) $\sec \theta = -\frac{3}{2}$, $\pi < \theta < \frac{3\pi}{2}$</p> 	<p>i) $\cos \theta = \frac{1}{5}$, $\tan \theta < 0$</p> 
<p>j) $\sin \theta = -\frac{2}{9}$, $\sec \theta > 0$</p> 	<p>k) $\tan \theta = -4$, $\sin \theta > 0$</p> 	<p>l) $\csc \theta = 6$, $-\frac{3\pi}{2} < \theta < -\pi$</p> 

3. Write 4 different "Given" statements that could be represented by each triangle below. Use each of the 4 methods to specify the quadrant.

a)



b)

