Name: Key Date: ________ Per: ________

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.	+	-	II
b.	-	+	IV
c.	-	-	III

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

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

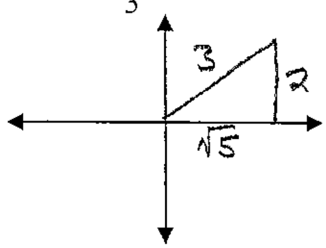
The quadrant can be specified in a number of ways:

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")

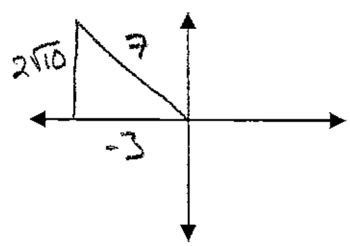
(A 5th method, using an inverse trig function, will be covered toward the end of this chapter).

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

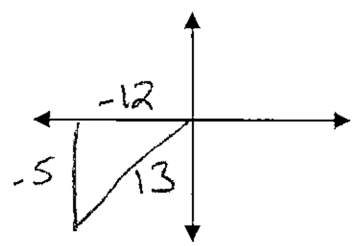
a) $\sin\theta = \frac{2}{3}$, θ is in Quad I



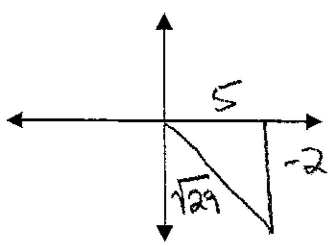
b) $\cos\theta = -\frac{3}{7}, \frac{\pi}{2} < \theta < \pi$



c) $\tan\theta = \frac{5}{12}, \sin\theta < 0$



d) Point $P(5,-2)$ is on the terminal side of θ



$\cos\theta = -1/3$

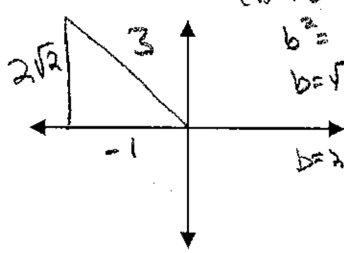
e) $\sec\theta = -3, \tan\theta < 0$

$(-1)^2 + b^2 = 3^2$

$b^2 = 8$

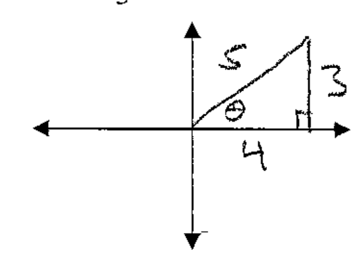
$b = \sqrt{8}$

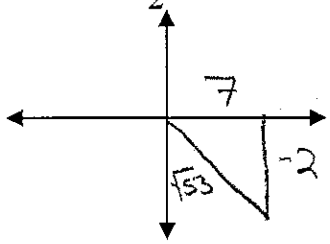
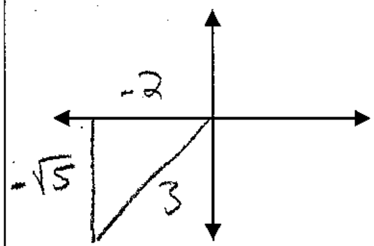
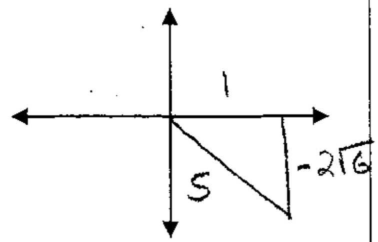
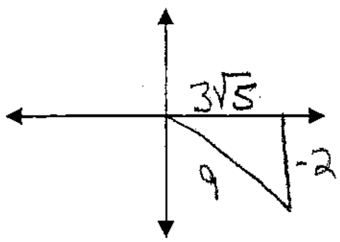
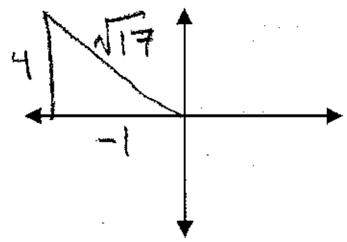
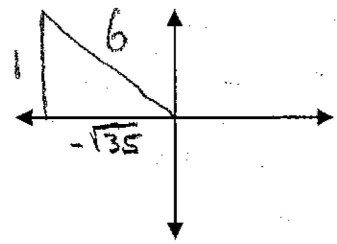
$b = 2\sqrt{2}$



$\sin\theta = 3/5$

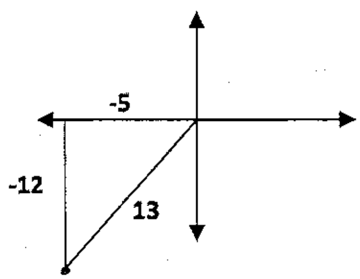
f) $\csc\theta = \frac{5}{3}, \cos\theta > 0$



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

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)



Given:

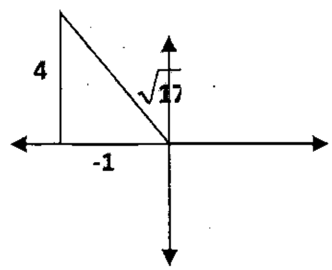
(A) $\cos\theta < 0, \quad \sin\theta < 0$

(B) θ is in Quad III

(C) $\pi < \theta < \frac{3\pi}{2}$

(D) The point $(-5, -12)$ is on the terminal side of θ.

b)



Given

(A) $\cos\theta < 0, \quad \sin\theta > 0$

(B) θ is in Quad II

(C) $\pi/2 < \theta < \pi$

(D) the point $(-1, 4)$ is on the terminal side of θ.