

(Blitzer, chapter 4)

1. The value of the cosine of a certain angle is $\frac{1}{2}$. If the angle is in Quadrant IV, then what are the exact values of the other trigonometric functions? (15)
2. A surveyor measures an acute angle of a right triangle to be $25^\circ 46' 21''$ and the hypotenuse to be $56.3 m$. What are the other two angles and sides of the triangle? (15)
3. What are all the solutions to the following equations?
 - a. $\csc x = 1$ (10)
 - b. $\sin^2 x = 1 - \cos^2 x$ (10)
4. What is the exact value of each of the following?
 - a. $\tan(\sin^{-1} 1/3)$ (5)
 - b. $\cos^{-1}(\cos 1/4)$ (5)
 - c. $\csc(\cos^{-1} 2)$ (5)
5. A plane takes off and flies $200 mi$ due east then turns due north and flies another $150 mi$.
 - a. How far is it from its take off point? (5)
 - b. In what direction is it from its take off point? (5)
6. The number of daylight hours in Boston is given by:

$$y = 12 + 3\sin\left[\frac{2\pi}{365}(x - 79)\right]$$

where x is the number of days since January 1.

- a. What is the amplitude? (3)
 - b. What is the period? (3)
 - c. What is the phase shift? (4)
 - d. Sketch the graph of the function for one full period starting with January 1. (5)
7. What is the domain and range for the following functions:
 - a. $\cos x$ (4)
 - b. $\tan x$ (4)
 - c. $\csc x$ (4)
 - d. $\sin^{-1}x$ (4)