

This spine-tingling fifty-minute test covers sections 6.5 of Blitzer's *College Algebra: An Early Function Approach* and our trigonometric supplement. Clearly indicate your answers. Unless otherwise indicated, all parts of all problems are four points each.

1. Find the determinant of the following matrices

a.  $\begin{bmatrix} 7 & 0 \\ 4 & 3 \end{bmatrix}$

b.  $\begin{bmatrix} 2 & 4 & -4 \\ 0 & 2 & -4 \\ 0 & 4 & -3 \end{bmatrix}$ .

2. Add the angles  $37^\circ 14' 21''$  and  $14^\circ 39' 12''$ .

3. Convert  $37^\circ 14' 21''$  to DD. (Round to four decimal places.)

4. Convert 37.1421 to DMS. (Round to the nearest second.)

5. Find  $\csc(37^\circ 14' 21'')$ . (Round to four decimal places.)

6. Find the acute angle  $\theta$ .  $\sec \theta = 1.1351$  to DMS. (Round to the nearest second.)

7. Given a right triangle with legs  $a = 4$  and  $b = 7$ , find the length of the hypotenuse and then evaluate the exact six trigonometric functions of the angle  $A$ .

$$\sin A =$$

$$\cos A =$$

$$\tan A =$$

$$\csc A =$$

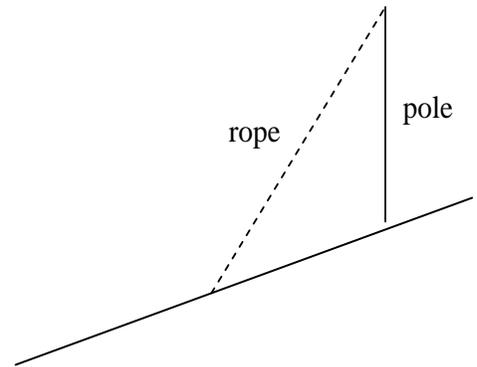
$$\sec A =$$

$$\cot A =$$

8. From a point on the top of a cliff that is 200 feet above Lake Sadding, the angle of depression to a boat is  $21^\circ$ . Find the line-of-sight distance to the boat. (6 points)

9. Suppose that the angle of elevation of the sun is  $45^\circ$ , find the length of the shadow cast by Mitchell Jordan whose height is 4.9 ft. (6 points)

10. A 17 foot flag pole stands on top of a hill which slants  $13^\circ$  from the horizontal. A rope is stretched from a point down the slope from the pole to the top of the pole. If this rope makes an angle of  $25^\circ$  with the pole, how long is the rope? (6 points)



11. A triangular plot of land has sides 250 ft, 350 ft and 470 ft. Find the largest angle of this triangle to the nearest minute. (6 points)

12. John and Sam were standing together. From that point John walked one mile due East, while Sam walked 1 mile on a bearing of  $N30^\circ E$ . How far apart are they now? (6 points)