

This test covers section 8.5 of College Algebra by Sullivan and Sullivan, and the trig supplement. Show your work and clearly indicate your answers. Relax and read each question carefully. Unless otherwise indicated, each part of each problem is worth five points.

1. What is $\binom{15}{7}$?

2. Expand (find all four terms) of $(2x - 3y)^4$.

3. Find the coefficient of x^3y^4 in $(5x + 4y)^7$.

4. State the law of sines and the law of cosines

sines:

cosines: $c^2 =$

5. What is the sum of $23^\circ 56' 59''$ and $39^\circ 28' 34''$? (Answer in DMS)

6. If $\csc \theta = 14$, what is θ to the nearest second?

7. Given a right triangle $\triangle ABC$, where $m\angle C = 90^\circ$, $a = 12$ and $c = 13$, find the **exact six** trigonometric functions of $\angle A$. (Warning: the second column is not in the usual order)
(3 points each)

$$\sin \angle A =$$

$$\sec \angle A =$$

$$\cos \angle A =$$

$$\cot \angle A =$$

$$\tan \angle A =$$

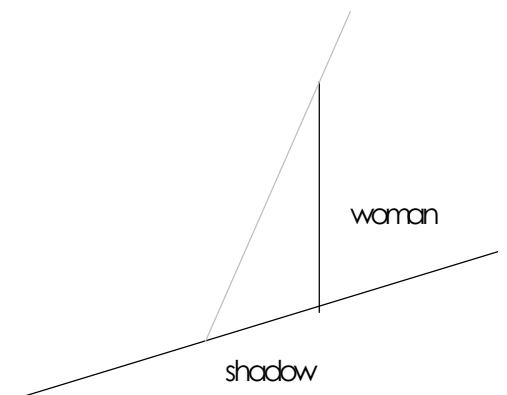
$$\csc \angle A =$$

Answer four of the following five trigonometric word problems. It is almost always helpful to draw a picture first and label your triangle with any know information. If stuck, ask yourself “have I used all of the information given?” Round all answers to two decimal places. (9 points each)

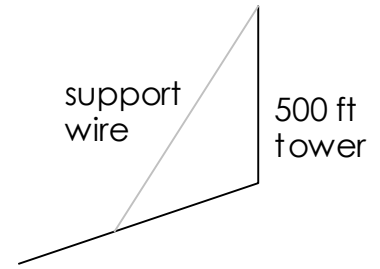
8. A man is standing on top of a 400 foot cliff and looking down at a boat on the lake below. If the angle of depression is 53 degrees, how far is the boat from the base of the cliff?

9. If a 50 foot long ramp between floors makes an angle of 15 degrees with the horizontal, what is the vertical distance between the floors?

10. A straight road makes an angle of 12° with the horizontal. The angle of elevation of the sun is 74° . How long of shadow is cast by a six foot tall police woman standing on the side of the road?



11. A hill makes an angle of 22 degrees with the horizontal. A 500 foot tower stands on top of the hill and a support wire runs from the top of the tower to a point 500 feet down the hill. How long is the support wire?



12. A triangle has sides of length 13, 15 and 18. What is the measure of the angle opposite the side of length 15? (Round your answer to the nearest tenth of a degree.)