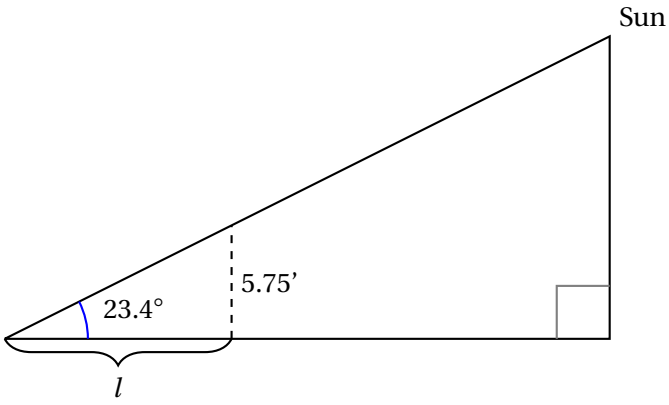
Section 2.5

Applications with Triangles

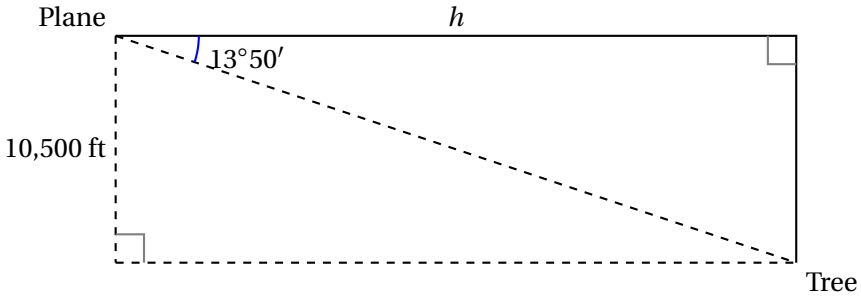
APPLICATIONS

The following problems adhere to the principle of Significant Figures. Your answer should too.

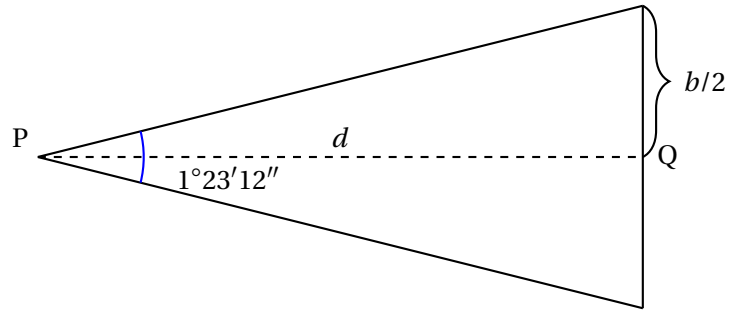
1. *Length of a Shadow* Suppose that the angle of elevation of the sun is 23.4°. Find the length of the shadow cast by a person who is 5.75 ft tall. The length of the shadow is denoted by l in the figure below.



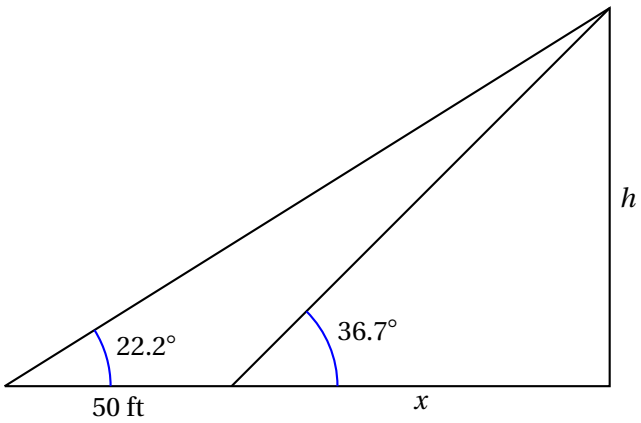
2. *Airplane Distance* An airplane is flying 10,500 ft above level ground. The angle of depression from the plane to the base of a tree is 13°50′. How far horizontally, h, must the plane fly to be directly over the tree?



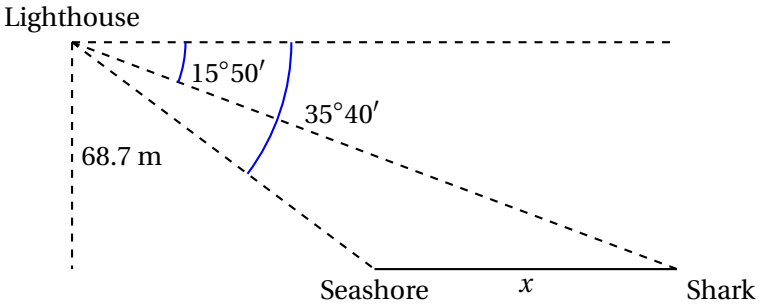
3. *Measuring Distance* The subtense bar method is a method that surveyors use to determine a small distance d between two points P and Q. The subtense bar with length b is centered at Q, perpendicular to the line of sight between P and Q. Angle θ is measured, and then d can be determined. Find d when $\theta = 1°23'12''$ and $b = 2.0000$ cm.



4. *Angles of Elevation* Francisco needs to know the height of a tree. From a given point on the ground, he finds that the angle of elevation to the top of the tree is 36.7°. He then movies back 50 ft. From that point, he finds the angle of elevation to the top of the tree is 22.2°. Find the height of the tree.



5. *Distance between a Shark and Seashore* In a lighthouse, known to be 68.7 ft tall, an observer identifies a shark at an angle of depression of $15°50'$. The observer then measures an angle of depression of $35°40'$ to the seashore. How far is the shark from the seashore?



6. *Distance between Ships* A ship leaves its port and sails with a bearing of S 61° 50' E. Another ship leaves the same port at the same time sailing on a bearing of N 28° 10' E. If the first ship sails at 24.0 mph and the second one sails at 28.0 mph, find the distance between the two ships after 4 hr. Sketch a picture!