A tower that is 125 feet tall casts a shadow 172 feet long. Find the angle of elevation of the sun to the nearest degree.
A plane rises from take-off and flies at an angle of 10 degrees with the horizontal runway. When it has gained 500 feet, find the distance, to the nearest foot, the plane has flown.

\[
\sin 10^\circ = \frac{500}{x} \\
x \sin 10^\circ = 500 \\
x = \frac{500}{\sin 10^\circ} \\
x = 2879 \text{ ft}
\]
A telephone pole is 60 feet tall. A guy wire 75 feet long is attached from the ground to the top of the pole. Find the angle between the wire and the pole to the nearest degree.

\[
\cos X = \frac{60}{75}
\]

\[
\cos^{-1} \left( \frac{60}{75} \right) = 37^\circ
\]

\[
\text{angle} \rightarrow \text{ratio}
\]

\[
\text{angle} \leftarrow \text{ratio}
\]
An observer stands 120 meters from a tree and finds that the line of sight to the top of the tree is 30 degrees above the horizontal. Find the height of the tree above eye level.
In traveling across flat land you notice a mountain directly in front of you. Its angle of elevation (to the peak) is 3.5 degrees. After you drive 13 miles closer to the mountain, the angle of elevation is 9 degrees. Approximate the height of the mountain.
A six foot person walks from the base of a streetlight directly toward the tip of the shadow cast by the streetlight. When the person is 16 feet from the streetlight and 5 feet from the tip of the streetlight's shadow, the person's shadow starts to appear beyond the streetlight's shadow. Find the angle of elevation of the shadow and then find the height of the streetlight.
A tapered shaft has a diameter of 5 centimeters at the small end and is 15 centimeters long. The taper is 3 degrees. Find the diameter $d$ of the large end of the shaft.