Applications - Laws of Sines & Cosines

1. \[ \frac{\sin 67^\circ}{200} = \frac{\sin 87^\circ}{x} \]
   \[ x = 184.35 \text{ yd} \]

2. \[ \frac{\sin 56^\circ}{b} = \frac{\sin 63^\circ}{a} = \frac{\sin 61^\circ}{0.5} \]
   \[ b = 0.474 \text{ mi} \quad a = 0.509 \text{ mi} \]

3. \[ \frac{\sin 25^\circ}{b} = \frac{\sin 15^\circ}{1} \]
   \[ h = 1.05 \text{ mi} \]

4. \[ \frac{\tan 60^\circ}{400} = \frac{x}{400} \]
   \[ x = 692.82 \text{ ft} \]

5. \[ \frac{\sin 3^\circ}{10} = \frac{\sin 75^\circ}{x} \quad \cos 12^\circ = \frac{y}{189.56} \]
   \[ x = 184.56 \text{ ft} \]

6. \[ \frac{\sin 36^\circ}{\theta} = \frac{\sin 27^\circ}{18} \]
   \[ \theta = 70.73^\circ \]
\( (4) \)
\[
\frac{\sin 77.17^\circ}{156} = \frac{\sin \text{Plant}}{123} \Rightarrow \frac{\sin 77.17^\circ}{156} = \frac{\sin \text{Plant}}{123} \\
\text{Planz and } = 50.24^\circ \Rightarrow x = 127.08 \text{ km}
\]

\( (8) \)
\[
x^2 = 300^2 + 320^2 - 2(300)(320)\cos 25^\circ \\
x = 135.614
\]

\( (9) \)
\[
x^2 = 96^2 + 128^2 - 2(96)(128)\cos 98^\circ \\
x = 170.35 \text{ m}
\]

\( (10) \)
\[
x^2 = 4.8^2 + 3.2^2 - 2(4.8)(3.2)\cos 54^\circ \\
x = 3.903
\]

\( (11) \)
\[
x^2 = 38.2^2 + 24.6^2 - 2(38.2)(24.6)\cos 18^\circ \\
x = 51.43 \text{ in}
\]
\[
y^2 = 38.2^2 + 24.6^2 - 2(38.2)(24.6)\cos 72^\circ \\
y = 38.52 \text{ in}
\]

\( (12) \)
\[
x^2 = 40^2 + 63^2 - 2(40)(63)\cos x^\circ \\
x = 46.755^\circ
\]

\( (13) \)
\[
x^2 = 12^2 + 28^2 - 2(12)(28)\cos x^\circ \\
x = 110.3^\circ \\
y = 69.7^\circ
\]
\[
x^2 = 90^2 + 60.5^2 - 2(90)(60.5)\cos 45^\circ \\
x = 63.72 \text{ ft}
\]