Lesson 3.2: Application

Ex 4: Navigation
A plane flies 810 miles from Niagra to Cuyahoga with a bearing of N75°E. Then it flies 648 miles from Cuyahoga to Rosemount with a bearing of N32°E. Find the straight line distance from Niagra to Rosemount.

\[ x = \sqrt{810^2 + 648^2 - 2 \times 810 \times 648 \cos(137)} \]

\[ x = 1357.8 \text{ mi} \]
Ex 5: Surveying
A triangular parcel of land has 115 meters of frontage, and the other boundaries have lengths of 76 meters and 92 meters. What angles does the frontage make with the other two boundaries?

\[ x = \cos^{-1}\left(\frac{(115^2 + 92^2 - 76^2)}{2 \cdot 115 \cdot 92}\right) \]
\[ x \approx 41^\circ \]

\[ y = \cos^{-1}\left(\frac{(115^2 + 76^2 - 92^2)}{2 \cdot 115 \cdot 76}\right) \]
\[ y \approx 53^\circ \]
Ex 6: Streetlight Design

Determine the angle $\theta$ in the design of the streetlight shown in the figure.

\[
\Theta = \cos^{-1}\left(\frac{3^2 + 2^2 - 4.5^2}{2 \times 3 \times 2}\right)
\]

$x \approx 127^\circ$

Homework: p.291-292 #29-35 odd