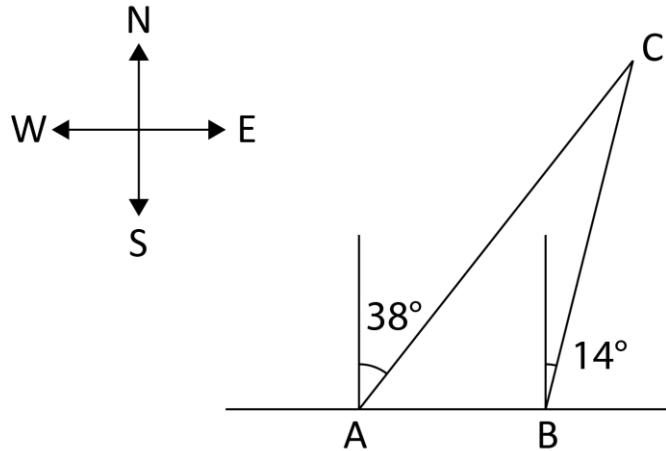


Answer on Question #42398 – Math – Calculus

Two weather tracking stations are on the equator 159 miles apart. A weather balloon is located on a bearing of N 38°E from the western station and on a bearing of N 14°E from the eastern station. How far is the balloon from the western station?

Solution. Let the point A denotes the position of the western station, the point B denotes the position of eastern station, the point C the position of the balloon.



$\angle CAB = 90^\circ - 38^\circ = 52^\circ$, $\angle ABC = 90^\circ + 14^\circ = 104^\circ$, $\angle ACB = 180^\circ - \angle CAB - \angle ABC = 24^\circ$, $AB = 159$ miles.

By the Sine Law

$$\frac{AB}{\sin \angle ACB} = \frac{AC}{\sin \angle ABC}.$$

Hence,

$$AC = \frac{AB \cdot \sin \angle ABC}{\sin \angle ACB} \approx 379.3044 \text{ miles.}$$

Answer. 379.3044 miles.