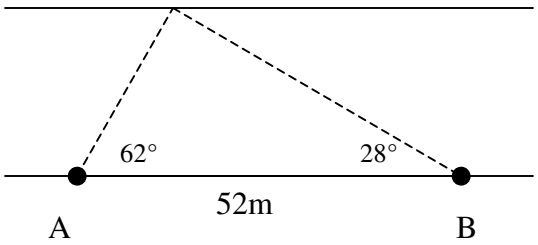
Problem Solving (1)

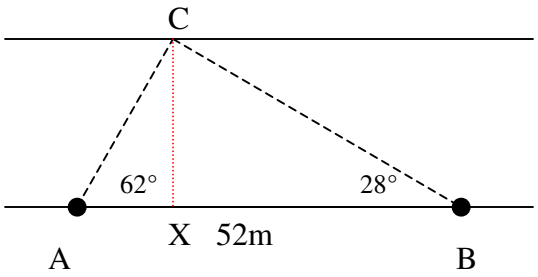
Example 1: A surveyor is trying to determine the width of a river. He finds a straight section of the river bank, locates a tree on the far side of the river bank, and measure a 62° angle from the bank to his line of sight (A). Next, he walks along the river bank until he finds a 28° angle (B), which is 52m from his first measurement.



a) Why did the surveyor walk until he found a 28° angle?

This produces a right angle at the tree, allowing him to use trigonometry to find the other side.

b) Determine the width of the river.



First we must find one of the diagonal distance across the river. Let's try for AC.

$$\sin 62 = \frac{AC}{AB}$$

$$\sin 62 = \frac{AC}{52}$$

$$AC = 52 \sin 62$$

$$AC = 45.91$$

Having found that, we use the smaller triangle ACX to find the width (CX).

$$\sin 62 = \frac{CX}{AC}$$

$$\sin 62 = \frac{CX}{45.91}$$

$$CX = 45.91 \sin 62$$

$$CX = 40.54$$

The width of the river is about 40.54m.

Activity / Practice: pg 13 #8, 9, 12, 13, 14, 17, 18, 20