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**Problem**: A wall extending East and west is 6 feet high. The sun has an altitude (angle of elevation) of 49°32′ and is 47°20′ east of south. Find the width of the shadow of the wall.

## Solution:



If the sun is shifted towards east of 47°20' (that is, clockwise direction) then the end of shadow will be shifted towards west of 47°20' (that is, clockwise direction). In Fig-2,  $\angle ACA' = 47^{\circ}20'$ .

Now the width of the shadow is A'C'. In the right angled triangle A'C'C,

 $\sin \angle A'CC' = \frac{A'C'}{A'C}$ 

 $\Rightarrow A'C' = (A'C)\sin \angle A'CC' = (AC)\sin(90 - 47^{\circ}20') = (5.1185) * \cos(42^{\circ}40') = 3.7637 \text{ ft}$ 

Required width of the shadow of the wall = 3.7637 ft.