



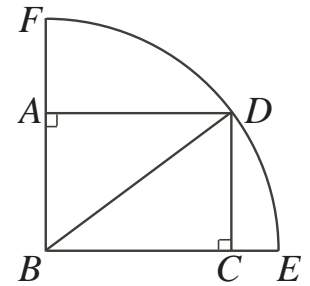
Problem of the Week

Grade 7 and 8

The Missing Link Solution

Problem

$ABCD$ is a rectangle inscribed in a quarter-circle as shown. A is on BF , B is the centre of the quarter-circle, C is on BE , and D is on arc FE . If $AD = 12$ cm and $CE = 1$ cm, determine the length of AF .



Solution

Since $ABCD$ is a rectangle, $BC = AD = 12$.

Then $BE = BC + CE = 12 + 1 = 13$.

Since $BEDF$ is a quarter circle with centre B , $BF = BD = BE = 13$.

Using the Pythagorean Theorem in right $\triangle BCD$,

$DC^2 = DB^2 - BC^2 = 13^2 - 12^2 = 169 - 144 = 25$ and $DC = 5$ (since $DC > 0$).

Since $ABCD$ is a rectangle, $AB = DC = 5$.

Then $AF = BF - AB = 13 - 5 = 8$ cm.

Therefore, the length of AF is 8 cm.

