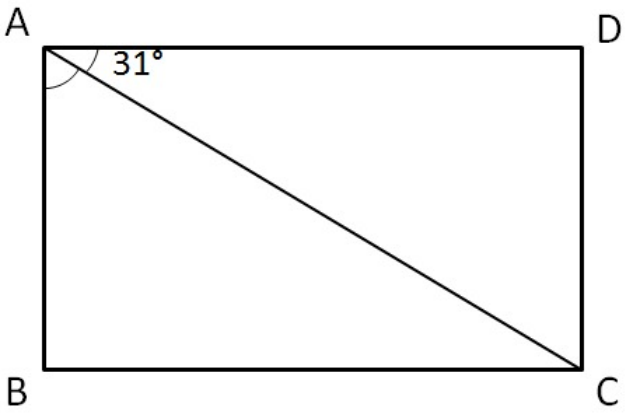
Illustrative Mathematics

4.MD,G Finding an unknown angle

Alignment 1: 4.G.A.2, 4.MD.C.7

In the figure, $ABCD$ is a rectangle and $\angle CAD = 31^\circ$. Find $\angle BAC$.



Commentary:
The purpose of this task is to give 4th grade students a problem involving an unknown quantity that has a clear visual representation. Students must understand that the four interior angles of a rectangle are all right angles (4.G.2) and that right angles have a measure of 90° and that angle measure is additive (4.MD.7). In a teaching scenario, students may be allowed to verify the computations using a protractor to measure the angles. However, care should be taken beforehand to ensure that the measurements of the printed figure match the stated measurements.

The task may also be viewed as preparation for later work when, in 6th grade, students are introduced to algebraic expressions. In that context, unknown angle problems will use variables to label missing angles, and students will write and solve equations to find the missing angle measures.

Solution: 1

All four angles in a rectangle are right angles, so $\angle BAD$ is 90°. Since $\angle BAC + \angle CAD = \angle BAD$, we have that

$$\angle BAC + 31^\circ = 90^\circ$$

which is the same as saying

$$\angle BAC = 90^\circ - 31^\circ.$$

Thus, $\angle BAC = 59^\circ$.