

## Applications of the Primary Trigonometric Ratios

### Example 1

A scuba driver swam north at 1.5 m/s across a current running from east to west at 2.0 m/s.

She swam for 3 minutes and then surfaced.

- a. Draw a diagram showing where the dive boat will pick her up relative to where she dove.
- b. How far did she travel?

**Example 2**

From the top of a canyon, the angle of depression to the far side of the river is 58 degrees, and the angle of depression to the near side of the river is 74 degrees. The depth of the canyon is 191 m.

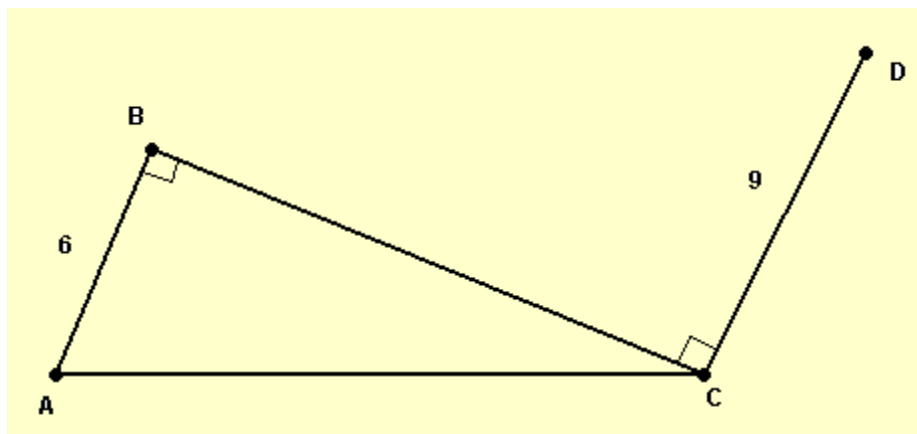
What is the width of the river at the bottom of the canyon?

Round to the nearest tenth of a meter.

**Opportunity to Learn**

1. In the figure below  $AB$  and  $CD$  are perpendicular to  $BC$  and the size of angle  $ACB$  is  $31^\circ$ .

Find the length of line segment  $BD$ .



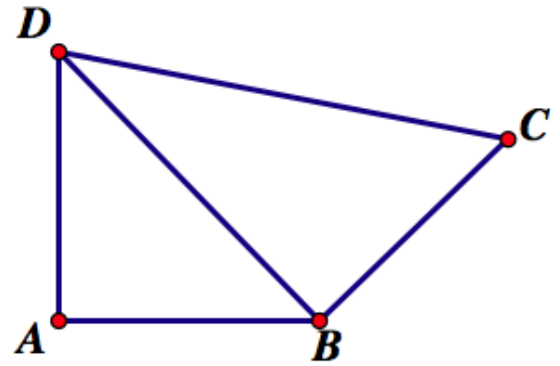
2.  $\angle DAB$  and  $\angle DBC$  are both  $90^\circ$ .

$\angle DBA$  is  $46^\circ$ .  $\angle DCB$  is  $55^\circ$ .

$\overline{AB}$  is 55 m.

What is  $\overline{DC}$ ?

Show your work, please.



3. A plane is flying at a constant altitude of 14,000 ft and a constant speed of 500 mph. The angle of depression from the plane to a lake is 6 degrees. To the nearest minute, how much time will pass before the plane is directly over the lake?