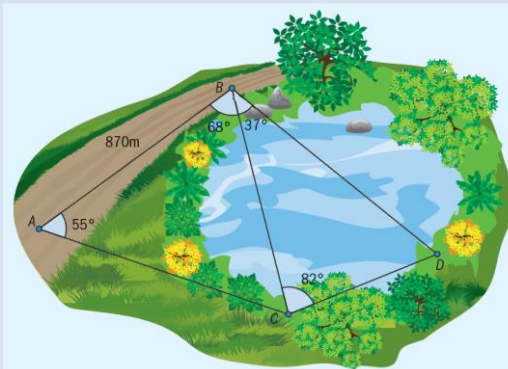


Chapter 1 / **Example 11**

# Using the sine rule to find a length

The diagram shows a lake with three docks at points B, C and D. The distance AB along a highway is known to be 870 m. Surveyors measure the angles as given in the diagram.

- Use triangulation to find the distances BC and BD.
- Nils, who rows at a speed of 1.5 m/s, starts from dock B. Calculate how much longer will it take him to cross the lake if he rows to the further of the two docks.



Press **[MODE]**.

Use the **[←]** **[→]** **[↑]** **[↓]** keys to place the cursor on DEGREE in the Mode menu, and then press **[ENTER]** to highlight it.

Press **[2nd]** **[QUIT]** to return to the home screen.

```
MATHPRINT CLASSIC
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNCTION PARAMETRIC POLAR SEQ
THICK DOT-THICK THIN DOT-THIN
SEQUENTIAL SIMUL
REAL a+bi re^(θi)
FULL HORIZONTAL GRAPH-TABLE
FRACTIONTYPE:n/d Un/d
ANSWERS: AUTO DEC FRAC-APPROX
GO TO 2ND FORMAT GRAPH: NO YES
STAT WIZARDS: OFF ON
SET CLOCK 09/07/18 8:28PM
```

Calculate  $\hat{C} = 180^\circ - 55^\circ - 68^\circ = 57^\circ$

```
180-55-68
.....57
```

$$BC = \frac{870 \times \sin 55^\circ}{\sin 57^\circ}$$

Enter the expression  $\frac{870 \times \sin 55^\circ}{\sin 57^\circ}$  directly.

Press **[ALPHA]** **[F1]** 1:n/d to add a fraction template.

$BC = 850$  m

```
180-55-68
.....57
870*sin(55)
sin(57)
.....849.7523411
```

Chapter 1 / **Example 11**

# Using the sine rule to find a length

$$BD = \frac{BC \times \sin 82}{\sin 61}$$

Press **[ALPHA]** **[F1]** 1:n/d to add a fraction template.

Navigate up to the result of  $BC$  and press **[ENTER]**. This will paste the value found to the maximum accuracy that the GDC stores it into the numerator.

Type **[x]** **[SIN]** 82 and close the parentheses.

Press **[v]**, enter sin 61 in the denominator and press **[ENTER]**.

$$BD = 962 \text{ m}$$

180-55-68	57
$\frac{870 \times \sin(55)}{\sin(57)}$	
849.7523411	
$\frac{849.7523411 \times \sin(82)}{\sin(61)}$	
962.1125649	

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

Press **[ALPHA]** **[F1]** 1:n/d to add a fraction template.

Navigate up to the result of  $BD$  and press **[ENTER]**. This will paste the value found to the maximum accuracy that the GDC stores it into the numerator.

Press **[=]**, navigate up to the result of  $BC$  and press **[ENTER]**.

Press **[v]**, type 1.5 in the denominator and press **[ENTER]**.

The time is 74.9 s.

$\frac{870 \times \sin(55)}{\sin(57)}$	57
849.7523411	
$\frac{849.7523411 \times \sin(82)}{\sin(61)}$	
962.1125649	
$\frac{962.1125649 - 849.7523411}{1.5}$	
74.90681587	