

Chapter 6 / **Example 15****Finding angles using the sine rule**

The diagram to the right shows a river with a 5 m long fence AB, built at an angle of 34° to the riverside.

Farmer Brown wants to fence off an area in the shape of a triangle ABC (as shown in the diagram) for his three goats. He has 3 m of fencing left. Find the angles ACB and ABC.



Press **MENU** 1 **Run-Mat** to display the Run-Matrix screen for arithmetical calculations.

Press **SHIFT** **MENU** (SETUP).

Scroll down using **▼** to Angle and change the setting to **F1** Deg.

Press **EXIT**.

```
Input/Output: Math
Mode          : Comp
Frac Result   : d/c
Func Type     : Y=
Draw Type     : Connect
Derivative    : Off
Angle         : Deg
Deg Rad Gra
```

$$\sin C = \frac{5 \sin 34^\circ}{3}.$$

Using your GDC enter the expression $C = \sin^{-1}\left(\frac{5 \sin 34^\circ}{3}\right)$ directly.

Press **SHIFT** \sin^{-1} then press **□** to add a fraction template.

```
sin⁻¹ □
□
```

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Type 5 **sin** 34 in the numerator.

Press **▼** to move to the denominator.

```
sin⁻¹ 5sin 34
      □
```

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Type 3.

Press **EXE**.

$$C = 68.7^\circ.$$

```
sin⁻¹ 5sin 34
      3
      68.74688646
□
```

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But C could also be obtuse too.

Enter $180 \div 3 \text{ [SHIFT] Ans.}$

$C = 68.7^\circ$ or 111.3° .

```
sin⁻¹ 5sin 34
      3
68.74688646
180-Ans
111.2531135
[ ]
JUMP DELETE MATHVCT MATH
```

The CG50 does not support simple copy and paste so return to the two previous commands and add $\rightarrow P$ and $\rightarrow Q$ to store the results in two variables.

$B = 180 - (34 + C)$.

$B = 77.3$ or 34.7 .

```
sin⁻¹ 5sin 34 →P
      3
68.74688646
180-Ans →Q
111.2531135
[ ]
JUMP DELETE MATHVCT MATH
```

Use these variables to calculate the possible values of B .

$B = 180 - (34 + C)$.

$B = 77.3$ or 34.7 .

```
180-Ans →Q
111.2531135
180-(34+P)
77.25311354
180-(34+Q)
34.74688646
[ ]
JUMP DELETE MATHVCT MATH
```