

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 **[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
FRACTION TYPE: n/d Un/d
ANSWERS: AUTO DEC FRAC-APPROX
GO TO 2ND FORMAT GRAPH: NO YES
STAT DIAGNOSTICS: OFF ON
STAT WIZARDS: ON OFF
SET CLOCK 09/07/18 8:28PM
```

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

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

Press **[2nd]** **[sin⁻¹]** then press **[X<Y>X]** **[f1]** 1:n/d to add a fraction template.

```
NORMAL FLOAT AUTO REAL DEGREE MP
sin⁻¹(
```

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

Close the parentheses and then press **[↵]** to move to the denominator.

```
NORMAL FLOAT AUTO REAL DEGREE MP
sin⁻¹( 5sin(34)
```

Type 3 Press **[▶]** and close the parentheses.

Press **[enter]**.

$$C = 68.7^\circ$$

```
NORMAL FLOAT AUTO REAL DEGREE MP
sin⁻¹( 5sin(34)
3
68.74688646
```

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But c could also be obtuse too.

Enter $180 \div \boxed{2\text{nd}} \boxed{\text{ans}}$.

$C = 68.7^\circ$ or 111.3° .

NORMAL FLOAT AUTO REAL DEGREE MP	
$\sin^{-1}\left(\frac{5\sin(34)}{3}\right)$	
	68.74688646
180-Ans	
	111.2531135

Copying the results for C , find the possible values for B .

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

$B = 77.3$ or 34.7 .

NORMAL FLOAT AUTO REAL DEGREE MP	
$\sin^{-1}\left(\frac{5\sin(34)}{3}\right)$	
	68.74688646
180-Ans	
	111.2531135
$180 - (34 + 68.74688646)$	
	77.25311354
$180 - (34 + 111.2531135)$	
	34.7468865