

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 3m of fencing left. Find the angles ACB and ABC.



Open a new document and add a Calculator page.

Use the touchpad to click on the wheel icon in the page header.

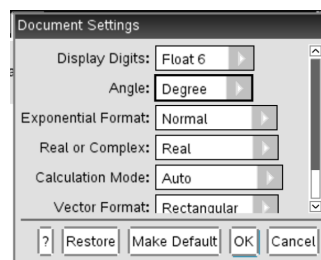


Select 2:Document Settings...

Select 'Degree' as the unit for Angle.

Use the touchpad to select OK or click **enter**.

The page header should now show 'DEG'.



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

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

Press **trig** and select \sin^{-1} from the menu with the touchpad.

sin	cos	tan	csc	sec	cot
\sin^{-1}	\cos^{-1}	\tan^{-1}	\csc^{-1}	\sec^{-1}	\cot^{-1}

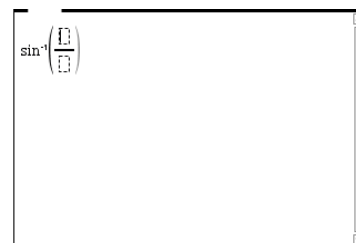
Press **ctrl** **[]** to enter a fraction template.

Type 5 in the numerator.

To enter sin Press **trig** and select sin from the menu with the touchpad.

Type 34 and then **▼** to move to the denominator.

Type 3 and press **enter**.



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$$C = 68.7^\circ.$$

The calculator screen shows the expression $\sin^{-1}\left(\frac{5 \cdot \sin(34)}{3}\right)$ in the input field, and the result 68.7469 is displayed on the right.

But C could also be obtuse too.

Enter $180 - \boxed{-} \boxed{\text{ctrl}} \boxed{\text{ans}}$.

$$C = 68.7^\circ \text{ or } 111.3^\circ.$$

The calculator screen shows the same expression as before, with the result 68.7469. Below it, the expression $180 - 68.74688645685$ is entered, and the result 111.253 is displayed on the right.

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

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

$$B = 77.3 \text{ or } 34.7^\circ.$$

The calculator screen shows the same expression as before, with the result 68.7469. Below it, two more expressions are entered: $180 - (34 + 68.74688645685)$ with result 77.2531, and $180 - (34 + 111.25311354315)$ with result 34.7469.