

U2D4a: Investigating Obtuse Angles

Introduction to the Activity:

In this activity, you will use your calculator and the following chart to investigate the trigonometric ratios of obtuse angles. Then, you will analyze the results to determine any patterns.

Performing the Activity

- 1) Refer to the chart that follows. For each of the listed angles, use your calculator to determine the value of each primary trigonometric ratio in the chart.
- 2) After you have completed the chart, answer the questions that follow.

Round values to 3 decimal places. There will be some rounding error.

Primary Angle, B	$\sin B$	$\cos B$	$\tan B$
5°	$\frac{\text{opp}}{\text{hyp}} \approx 0.087$	$\frac{\text{adj}}{\text{hyp}} \approx 0.996$	$\frac{\text{opp}}{\text{adj}} \approx 0.087$
10°			
25°			
30°			
89°			
91°			
150°			
155°			
170°			
175°			

Investigating Obtuse Angles (Continued)

After you have completed the chart, answer the following questions.

- 1) What do you notice about the signs (positive? negative?) of the values of $\sin B$? Be as specific as possible. Why does this happen?
- 2) What do you notice about the signs (positive? negative?) of the values of $\cos B$? Be as specific as possible. Why does this happen?
- 3) What do you notice about the signs (positive? negative?) of the values of $\tan B$? Be as specific as possible. Why does this happen?
- 4) Write down pairs of $\angle B$ that have approximately the same value for $\sin B$. Verify that the values are actually the same using your calculator. For example, check that $\sin 5^\circ$ and $\sin 175^\circ$ give the same value. How are the angles related to each other?

Using the same pairs of angles, what do you notice about the values of $\cos B$? (Verify on your calculator if needed.)

Using the same pairs of angles, what do you notice about the values of $\tan B$? (Verify on your calculator if needed.)

- 5) Use \sin^{-1} on your calculator to solve for angle B in $\sin B = 0.5$. What value does your calculator give?

What other value for B is possible?

How can you quickly determine the value of the second angle?

Complete the following using a calculator and what you have learned:

$$\begin{array}{ll} \sin B \approx 0.7660 & B \approx \underline{\hspace{2cm}} \text{ or } B \approx \underline{\hspace{2cm}} \\ \sin B \approx 0.9205 & B \approx \underline{\hspace{2cm}} \text{ or } B \approx \underline{\hspace{2cm}} \end{array}$$