

Chapter 9- Lesson 6

Using Your Calculator

Goals

- Recognize when to use a trig. function or an inverse trig. function to solve a missing angle or missing side problem.
- Use trig. and inverse trig. functions on a calculator to solve right triangle problems.

In the previous lessons you have learned:

- Where trigonometric ratios come from and why they work.
- How to use trigonometric ratios and trigonometric tables to:
 - find the reference angle when you **knew** the length of two sides of a right triangle
 - find the length of a side of a right triangle when you **knew** the length of one other side and the measure of the reference angle.
- The code names of the ratios

In this lesson you will learn how to use your calculator instead of a table of trigonometric ratios.

The Buttons on Your Calculator— The Direction of the Table

The next thing you need to know is what buttons to push on your calculator. As you know from your work with the trig. table, you either *start with a ratio and get an angle* or you *start with an angle and get a ratio*.

Start with a ratio and get an angle	\sin^{-1} , \cos^{-1} , \tan^{-1}	Inverse Trig. Functions
Start with an angle and get a ratio	\sin , \cos , \tan	Trig. Functions

Angle °	adjacent : hypotenuse	opposite : hypotenuse	opposite : adjacent
26	0.8988	0.4384	0.4877
27	0.8910	0.4540	0.5095
28	0.8829	0.4695	0.5317
29	0.8746	0.4848	0.5543
30	0.8660	0.5000	0.5774
31	0.8572	0.5150	0.6009
32	0.8480	0.5299	0.6249
33	0.8387	0.5446	0.6494

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Practice: Decide on the Type of Function

For each of the following questions, decide if you will use a “normal” trigonometric function or an inverse trigonometric function.

- Find the $m\angle A$ when the $\sin(m\angle A) = 0.3$.
- What is the sine of 30° .
- The lengths of the adjacent and opposite sides of a right triangle are 15 and 20. What is the measure of the reference angle?
- One leg of a right triangle is 20 cm. One of the angles is 25° . What is the length of the hypotenuse of the triangle?
- The ratio of the legs of a right triangle are 2:3. What are the measures of the acute angles of this triangle?

Steps

The following steps can be used to help guide you through solving right triangle trig. problems.

- Make a sketch triangle. Label the sides “adj”, “opp”, “hyp”. Write any the lengths of the sides or the measures of the angles that you know onto the sketch.
- Label what you need to find on the sketch.
- Decide on which trig. function (sin, cos, tan) or inverse trig. function (\sin^{-1} , \cos^{-1} , \tan^{-1}) you are going to use.
- Write a trigonometric equation.
- Use algebra to isolate the variable.
- Use your calculator to “look up” the angle measure or the ratio.
- Interpret and write your answer.

Try Some Problems

- Find $m\angle A$ in $\triangle ABC$ where $m\angle C = 90^\circ$, $AB = 12$, and $AC = 6$.
- Find AC in $\triangle ABC$ where $m\angle C = 90^\circ$, when $m\angle A = 58^\circ$ and $BC = 15$

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Using Your Calculator- Partner Challenge 1



Set 1

Solve.

- $\sin(\angle A) = 0.26,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $\cos(\angle A) = 0.58,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $\tan(\angle A) = 1.2,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $\sin(\angle A) = 0.85,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $\cos(\angle A) = 0.5,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$

Set 2

Solve.

- $m\angle A = 83^\circ$
 $\sin(\angle A) = \underline{\hspace{2cm}}$
- $m\angle A = 83^\circ$
 $\cos(\angle A) = \underline{\hspace{2cm}}$
- $m\angle A = 83^\circ$
 $\tan(\angle A) = \underline{\hspace{2cm}}$
- $\sin(\angle A) = 0.42,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $\tan(\angle A) = 0.42,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$

Set 3

Solve.

- $m\angle A = 45^\circ$
 $\sin(\angle A) = \underline{\hspace{2cm}}$
- $\tan(\angle A) = 1,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $m\angle A = 30^\circ$
 $\cos(\angle A) = \underline{\hspace{2cm}}$
- $\tan(\angle A) = 57,$
 $m\angle A = \underline{\hspace{2cm}}^\circ$
- $m\angle A = 60^\circ$
 $\cos(\angle A) = \underline{\hspace{2cm}}$

Set 3

Answers

- 0.707
- 45°
- 0.866
- 88.995
- 0.5

Set 2

Answers

- 0.993
- 0.122
- 8.144
- 24.834
- 22.782

Set 1

Answers

- 15.070°
- 54.549°
- 50.194°
- 58.212°
- 60°