



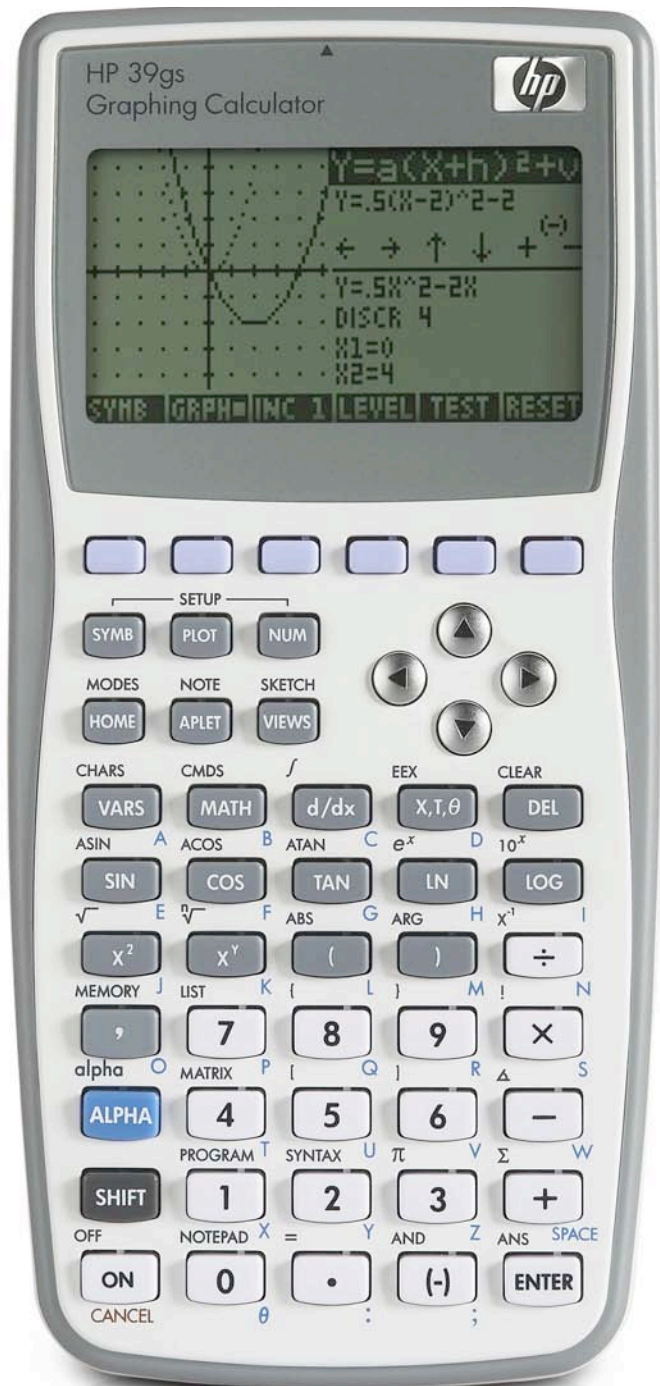
hp calculators

HP 39gs The triangle solver

Solving triangles

The triangle solver

Practice solving triangles



Solving triangles

Historically, solving triangles meant identifying the known values from a triangle and then applying certain rules to find the unknown values. The solution approach differed depending on whether one knew the length of the three sides of a triangle (sometimes known as SSS), or whether one knew the measurement of two angles and the length of the side between them.

Now, with the HP 39gs calculator, triangles may be solved without having to apply a specific technique.

The triangle solver

The HP 39gs contains a specialized applet that solves triangle problems. The HP 39gs triangle solver looks for three of the six possible values for angles and sides of a triangle and attempts to solve for the unknown values using techniques as described in the previous paragraph.

The solver has two different modes: one solves general triangles and the other solves triangles containing a right angle. Note that since this applet works with angles, the choice of angle mode (degrees, radians or grads) will affect results.

To access this applet, press the **APLET** key. Use the arrow keys until the Triangle Solve applet is highlighted and press **ENTER**. The Triangle Solve applet is opened as shown below.



Figure 1

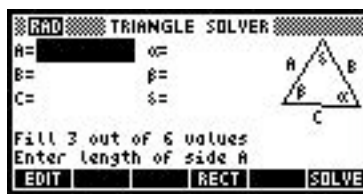


Figure 2

There are some triangles where more than one solution exists for the supplied data. In that situation, a menu key will be shown between the **RECT** and **SOLVE** keys and will show as **1/2**. To view the second solution, press **1/2**. To go back to the first solution, press **1/2** again.

In other situations, no solution exists for the supplied information. The HP 39gs triangle solve applet will indicate that either there is no solution with the given data or that there is simply not enough data provided yet to attempt a solution. Either correct the entered data or provide more information for the solver to continue the solution.

Practice solving symbolic differentiation problems

Example 1: Solve the triangle with two sides of 10 feet and an angle between these two sides of 40 degrees.

Solution: First, change to degrees mode. **SHIFT** **MODES** **DEGREES**



Figure 3

ENTER Now, start the Triangle Solve applet. **HOME** **APLET** **TRIANGLE SOLVE**

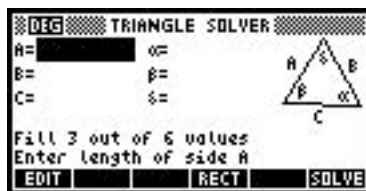


Figure 4

If the aplet contains any data from a previous problem, clear it by pressing **SHIFT** **CLEAR**.

1 **0** **ENTER** **4** **0** **ENTER** **1** **0** **ENTER**

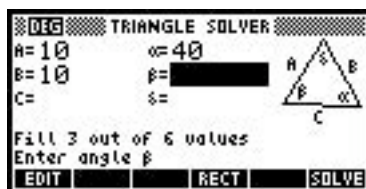


Figure 5

SOLVE



Figure 6

Answer:

Example 2: Solve the right triangle with a hypotenuse of 10 and another side of 6. Assume the triangle solve aplet is still open.

Solution: **SHIFT** **CLEAR** To solve right triangles, place the aplet into right angle triangle mode by pressing **RECT**. Notice how the picture of the triangle shown changes to one containing a right angle.

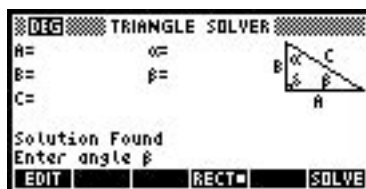


Figure 7

6 **ENTER** **▶▶▶▶▶** **1** **0** **ENTER**



Figure 8

SOLVE

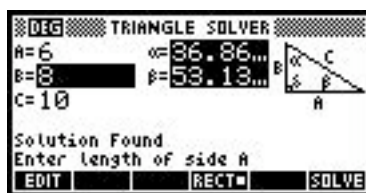


Figure 9

Answer:

Example 3: Solve the triangle with sides of 6, 7 and 8. Assume the triangle solve aplet is still open.

Solution: SHIFT CLEAR MODE (To turn off explicit right angle mode).

6 ENTER 7 ENTER 8 ENTER

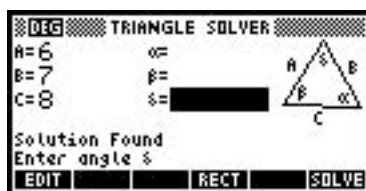


Figure 10

SOLVE

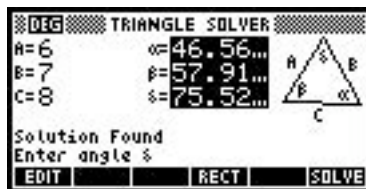


Figure 11

Answer:

Example 4: Solve the triangle with angles of 60, 100, and 20 degrees. Assume the triangle solve aplet is still open.

Solution: SHIFT CLEAR MODE 60 ENTER 100 ENTER 20 ENTER

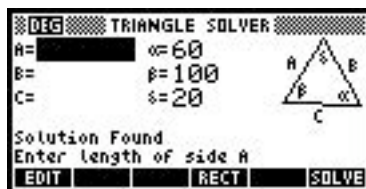


Figure 12

SOLVE

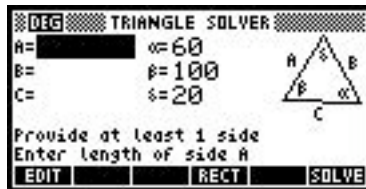


Figure 13

Answer:

No solution exists to the triangle as entered.