

1. What is Algy 2?

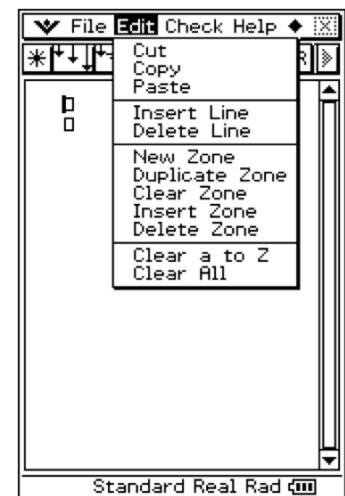
A software application that sits atop a computer algebra system (CAS) that checks whether or not:

- two or more numbers are equivalent
- the value of two or more expressions are equivalent
- two or more equations are mathematically correct transformations of one another.

Or, in student-speak, Algy 2 checks your working out and pinpoints the line in which you have made an error.

2. Before you use Algy 2 – every time

You should first check the computation settings at the bottom of the screen. Tapping each of the words changes the setting. For now, set them to Standard, Real and Rad.

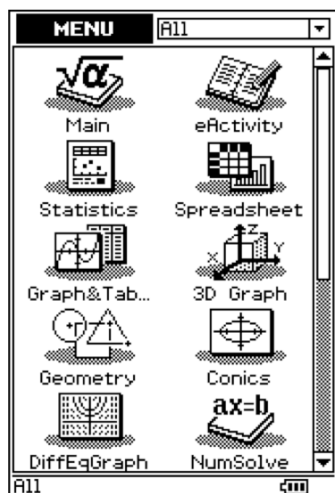


Because you can enter algebraic material into Algy 2, you need to be sure that the variables you enter (for example, x) have not been made to hold a single numeric value.

The easiest way to do this is to choose Clear a to Z from the Edit menu. This clears all 52 single letter variables (lower and upper case).

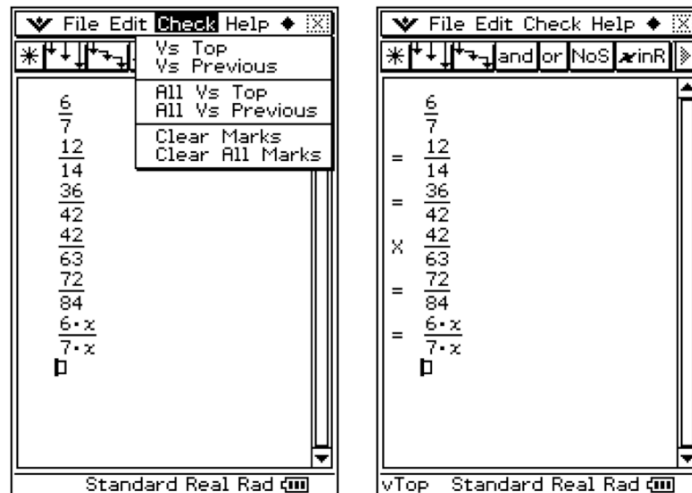
However, if you are using Algy 2 on a ClassPad, this command will clear the values of these variables outside of the Algy 2 realm as well.

If you wish to have greater control, you can clear the value of individual variables from the Main application of the ClassPad using the delvar_ command.



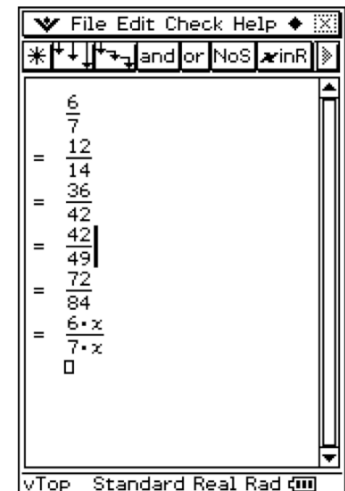
3. Checking if things are equal

Suppose you are challenged to write down five fractions that are equal in value to $\frac{6}{7}$. My attempts can be seen below. I want to check each effort against the top entry. So from the Check menu, I choose Vs Top.

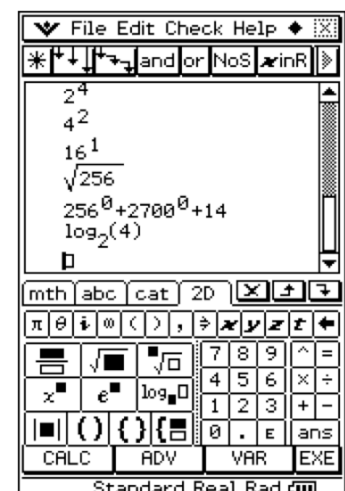


So clearly $\frac{6}{7} \neq \frac{42}{63}$. You can now edit just that fraction and check Vs Top again. All good now!

Note that Algy 2 indicates things are equal with an '=' sign.

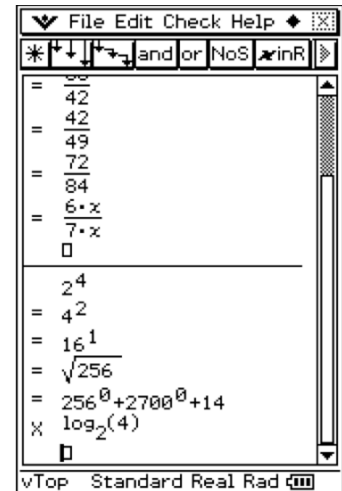


Suppose you are asked to write down four forms equal in value to 2^4 . Tap * to make a new zone. You can see my attempts right.



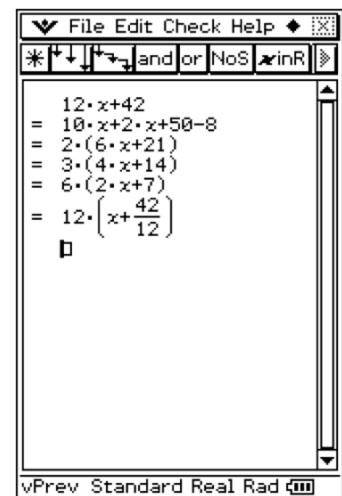
There is a shortcut icon that can be used for checking Vs Top.

Mmm, I did not get the logarithm quite right; can you fix it?

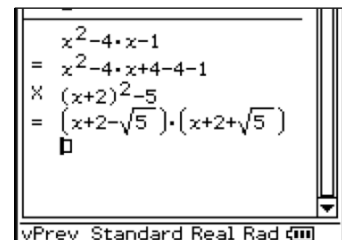


Algy 2 can also check the equality of expressions. Suppose you are asked to write down four different expressions that have equal value to $12x + 42$ for all real values of the unknown ($x \in \mathbb{R}$).

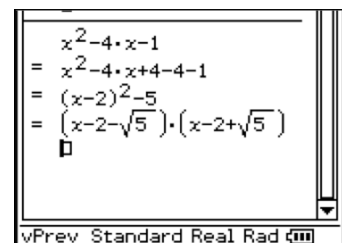
I managed five – can you make some different ones?



Suppose I am asked to factorise $x^2 + 4x - 1$ by completing the square. See right for my first attempt – checked vs. previous. Error in third line!



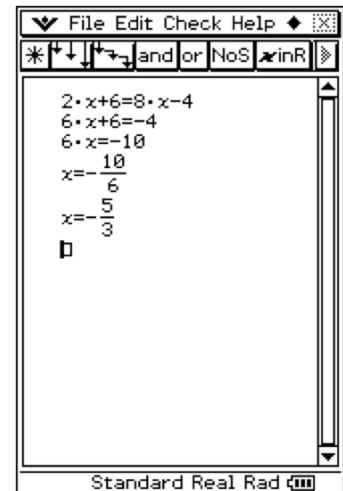
Ah yes, the positive should be a negative – edit lines 3 and 4 and check vs. previous again – all good!



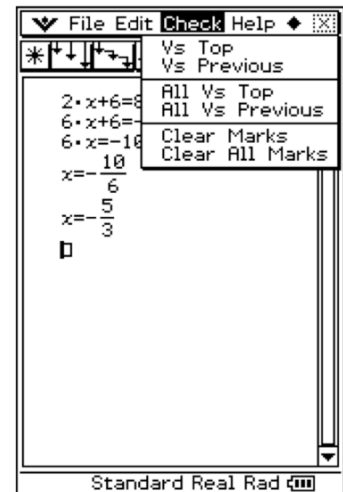
4. Solving a linear equation

For example, suppose I had to solve the equation $2x + 6 = 8x - 4$. My first attempt at a solution can be seen opposite, written in Algy 2 instead of on paper.

Am I correct?



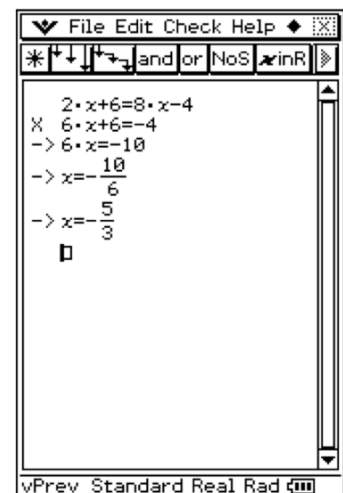
From the 'Check' menu I choose check 'vs. Previous' and Algy 2 checks each line of mathematics for a logical progression from the previous.



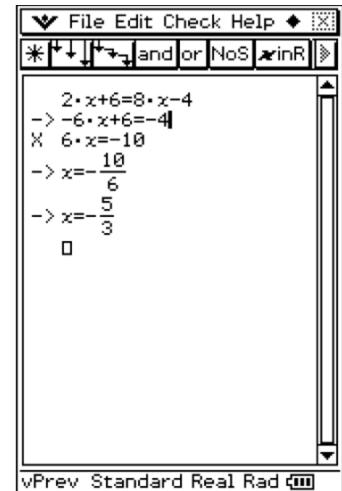
The X indicates line 2 does not follow from line 1 – so I can now think about, and perhaps converse with others, to determine my error.

The arrows (->) to the left of lines 3, 4 and 5 indicate that each line correctly follows from the previous, so I have only made one error!

Had you checked this answer in the back of the book, you would have only known you had the wrong answer.

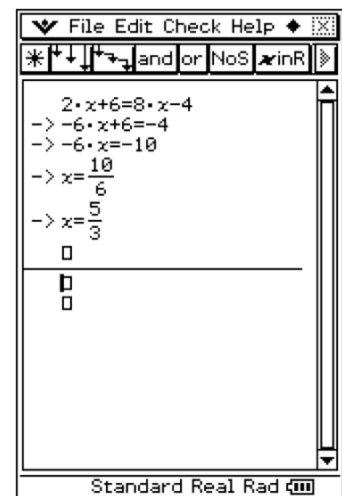


I can now edit the first line, repairing my error, and check again. Now I see my second line follows from my first, but not my third from my second.



I can now edit each of the remaining lines, repairing the follow-through-error, and check again. All good now!

Tapping the * results in a 'ruling off' of the previous solution and a new Algy 2 zone is formed awaiting a new solution to be entered and checked.

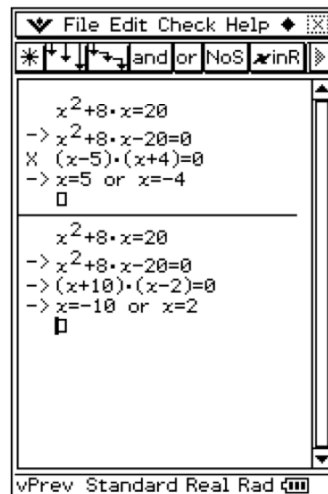
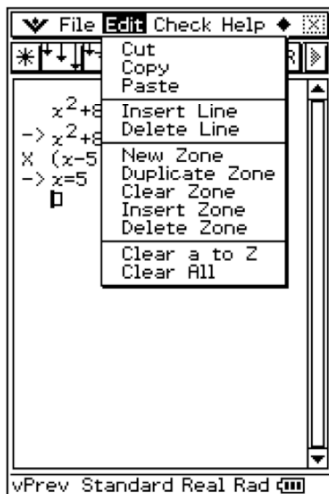
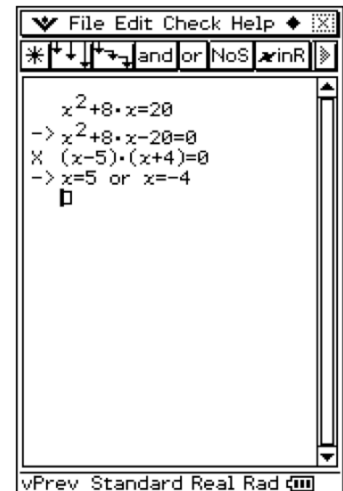


5. Solving a quadratic equation – part 1

Suppose you had to solve $x^2 + 8x = 20$ for $x \in \mathbb{R}$.

You can see my first attempt right, checked vs. Previous; clearly I have not factorised correctly. Note that the 'or' is entered using the or icon.

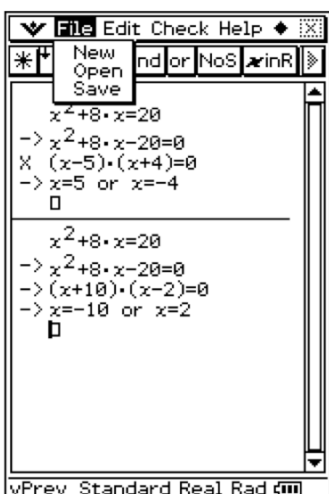
Instead of editing this attempt, I can duplicate this whole zone and then edit the duplicated zone, so I can retain the error I made on screen.



I can save a collection of solutions for later reference.

Choose Save from the File menu.

You can make a new folder to store this file in. Once made, select the folder (to tell the ClassPad you want the file to be saved in it) and then in the 'filename' field enter the filename you desire. Tap save.



You can open this file at any time by choosing Open from the File menu.

6. Solving a quadratic equation – part 2

Suppose you had to solve $\frac{3}{x} + x = 2$ for $x \in \mathbb{R}$.

You can see right that I have entered my attempt and checked vs. Previous.

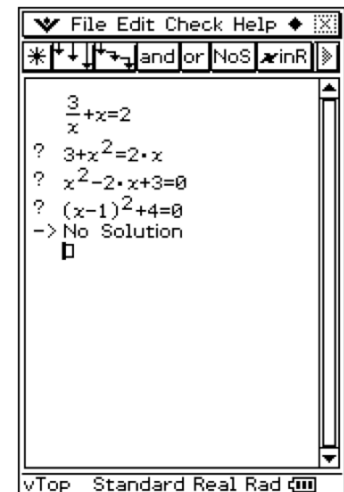
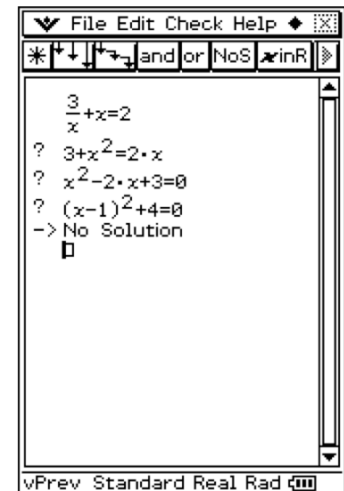
Algy 2 has returned a series of ? but tells me (with the ->) that the last line follows from the 4th line.

A ? from Algy 2 means it is unsure if the logic is correct. Hence, I am not certain if the last line follows from the actual question.

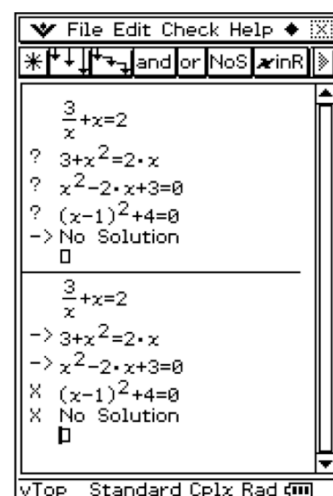
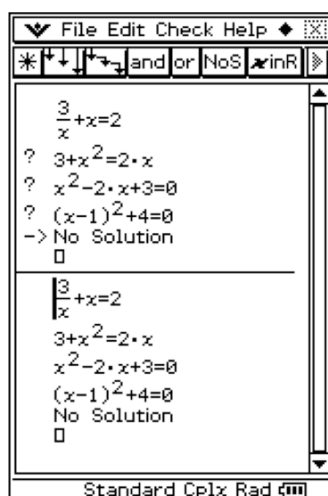
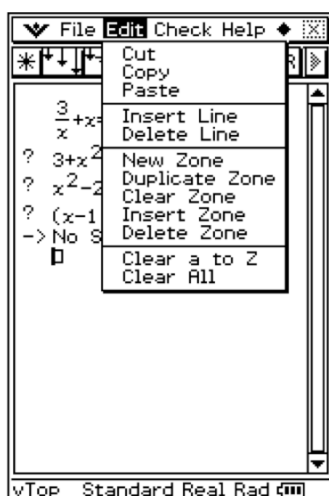
There are two checking processes:

1. vs. Previous and
2. vs. Top

If I now check vs. Top, each line is checked for a logical flow from the top line. The same output results, but I now know I was correct in concluding this equation has no real solutions.



Of course this equation will have solutions in the Complex realm. From the Edit menu I have chosen Duplicate zone. The settings shown at the bottom of the screen are tap-able and I have tapped Real to change it to Cplx. Then I have checked vs Previous.



Oh! I now see I had an error in 4th line. See if you can fix it and then give the correct solutions for the complex field.

7. Restricting the domain

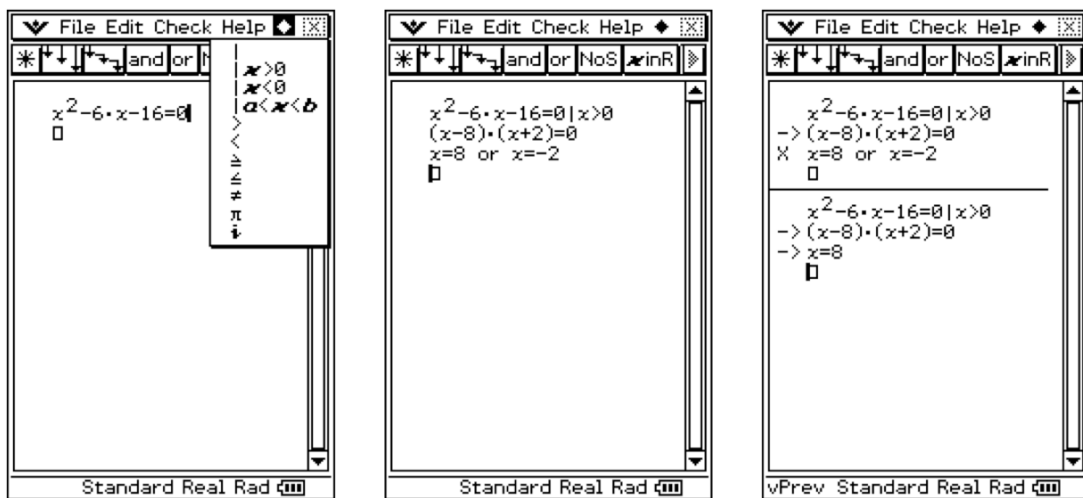
Suppose you have to solve $x^2 - 6x - 16 = 0$ for $x > 0$.

If nothing is mentioned to Algy about domain, it assumes $x \in \mathbb{R}$ if in Real mode and $x \in \mathbb{C}$ if in Complex mode.

To restrict the domain as required by this question, when entering the first line of a solution append it with $|x > 0$.

Tap the diamond menu and choose the option you require or choose one and edit it.

Note that Algy 2 assumes each line that follows the first is restricted to the same domain as that set in the first line.

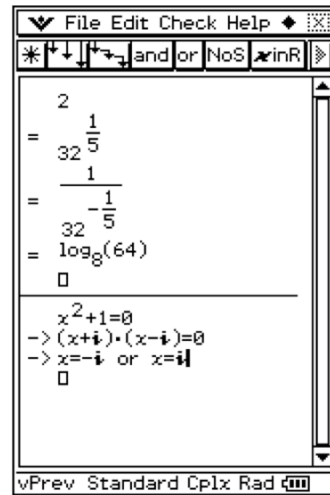
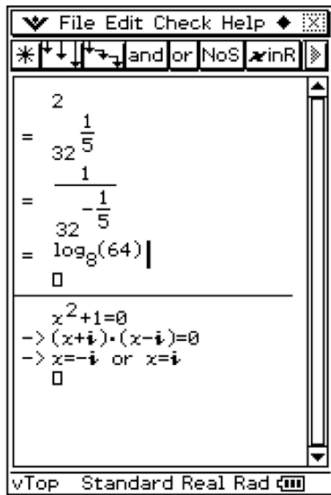


8. Zones, settings and marks.

As you are now aware, you can have multiple zones, each containing one solution.

When each zone is created, along with the contents you add, the settings, the mode of checking (both seen at the bottom of the screen) and the indicators of equal value (=) or logical progression (->) are also save with the zone.

The indicators are easy to see. To see the settings and mode of checking used for a zone, tap the cursor into it. This makes it active and you can see the active zone's settings and mode of checking at the base of the screen.



If a zone is edited, then indicators are deleted. You can then check your thinking again.

