It is more helpful to have this document on the screen alongside the app. Then you can read about the app and experiment with it at the same time. That is easy to do on a desktop or laptop computer, but harder on an iPad or iPhone. You can solve this problem by printing this document and others, which can be found on the **`brising.com`** website. Your web browser can help you print them out from there. Also, see our YouTube channel for video samples of DragginMath in action.

DragginMath works with algebraic *expressions*: sentences written in the language of mathematics. An *equation* is an expression that contains a *relation*, where = is the most common relation. An expression that contains some other relation is usually called an *inequality*. These words, *expression* and *equation*, are often used interchangeably, but you need to know they mean slightly different things. Sometimes it matters.

To begin doing algebra with DragginMath, tap the text field at the top of the screen. When you do this, a special keyboard appears at the bottom of the screen. Enter an equation, for example:

2x+3+4=9

As you enter this, watch the equation's diagram, or *operator tree*, being assembled as you type, and see how its parts are connected to each other.

There are two kinds of mistake you can make when typing: enter something that is just plain wrong, or enter something that is not really wrong but not what you intended. If you enter something that is just plain wrong, such as 2x+=, the text field

flashes red and you will hear a warning sound. Wrong inputs are not accepted: you can only enter text that is mathematically correct. If you enter something you didn't intend, such as 2x+2 when you wanted 2x+3, use backspace ⬅️ to fix your text. You can only remove or add text at the end. Cutting, pasting, or typing into the middle of existing text is not allowed. See the ℹ️ on the keyboard to learn more about what it can do for you.

When you finish entering an equation, tap ↵ on the screen keyboard. This is like the return key on a regular keyboard. The diagram is now complete, and it moves to the center of the screen. The diagram means the same thing as the text at the top, but the parts have been separated across and down the page. Curved lines and colored backgrounds show what connects to what in the equation's structure.

Put your finger on the 2 in the diagram. See a red circle appear around your fingertip. This means DragginMath has grabbed onto the 2 so you can move it. Drag your finger *straight to the left*. Notice the red circle moves with your fingertip. Lift your fingertip and see the 2 slide back where it came from. Nothing really happened here. That's OK.

Put your finger on the x in the diagram. See the red circle again. Drag your finger *straight to the right*. Lift your fingertip and see the x slide back where it came from. Nothing really happened here. That's OK.

Put your finger on the 2 again, then drag it *straight to the right* until the red circle turns purple. See the x slide into place where the 2 used to be. Lift your fingertip and see the 2 slide into place where the x used to be. Also, the text at the top now reads x∗2+3+4=9. Something happened here. This is an example of the Commutative Property of Multiplication. The equation now *looks* a little different, but it *means* the same thing.

Put your finger on the + that connects ∗ and 3. See the red circle appear. Drag *up*. Notice the red circle turns blue. Drag your fingertip over the other +. The background changes color and a black border appears. This means you are *on target*. Lift your fingertip and see the diagram rearrange itself. Also, the text at the top now reads x∗2+(3+4)=9. This is an example of the Associative Property of Addition. The equation now *looks* different, but it *means* the same thing.

Drag the + that connects 3 and 4, dropping it onto the =. See the diagram rearrange itself. Then drag the 2 onto the =. The equation now looks *very* different, but it always *means* the same thing. And, by the way, you have now solved the equation for x. You still need to do some arithmetic to see the solution. Put your finger on the 9, drag it *down* until the red circle turns green, then up onto the ÷. Lift your fingertip and see that x = 1.

This is how DragginMath works. Enter an equation and see its structure. Then drag its parts around to change its structure. After each change, the equation *looks* different, but it *means* the same thing. Only mathematically correct changes are allowed. If you try something that doesn't follow the rules of algebra, nothing happens and the parts go back where they came from.

DragginMath does these things and many more. It will take a while for you to become familiar with all of them, but none are any harder to do than this.

When you finish working on a problem, tap the text field at the top to clear the screen and begin again.

You can reposition any diagram by dragging its root. Yes, it is possible to lose things off the edge of the screen. If this happens, double-tap on whitespace to bring your diagrams back home. Or, if you drag on whitespace, all diagrams follow your motion, even those that are off the screen. The red circle does

not appear when you drag on whitespace.

You can undo ↩ and redo ↪ the steps in your current algebra problem, or you can review ⬆ all the steps in the problems you have worked on recently. Tap **;** to add another equation to those already on the screen. Tap ⇑ to show the current diagrams in linear notation, or ⇓ to turn linear notation back into diagrams. The linear notation for the current diagram is *always* in the text field at the top, but it can be helpful to watch a diagram change back and forth into text.

The ℹ icon on the main screen shares space with 🕑, which measures your performance. When you tap ↲ to finish an equation, a counter and timer begin, and ℹ becomes 🕑. Tap it when you finish solving a problem to see how many moves, changes, and seconds you used. All moves count, including those that did nothing. A change is a move that did something. Seconds are counted from the time you tapped ↲ to the time of your last change. The counter and timer continue after you tap 🕑, so you can continue working if you decide the problem isn't really solved. Or you can tap 🕑 just to see how you are doing so far. The counter and timer are reset only when you tap the text field at the top to start new work. If you are not interested in these numbers, just ignore 🕑. It will not bother you to work faster, and it affects nothing else.

Tap ☰ in the upper right corner of the main screen to see a short menu of optional settings for DragginMath. The options are different for iPad and iPhone. Each option has its own ℹ to help you understand it. The default option settings are a good place to start; you can always change your mind later, even in the middle of working on a problem.

If you want to know if something works in DragginMath,

try it! You can't hurt anything, and you might discover something interesting or useful.