MATLAB as a Calculator

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Structural Dynamics

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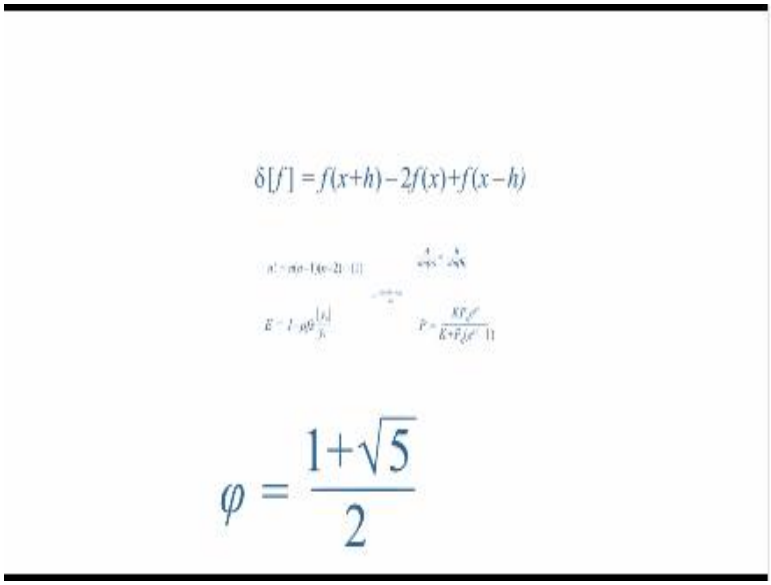

Sooner or later we are likely to encounter a problem whose solution requires a complicated formula and some serious number crunching some of which cannot be done by hand.

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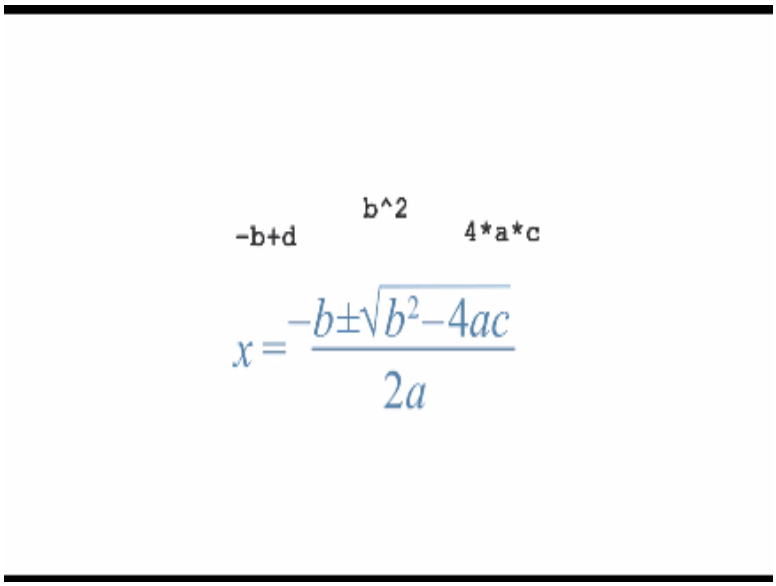

Let us consider a familiar example solving a quadratic equation this expression is composed of many different arithmetic operators that are the building blocks of most MATLAB calculations.

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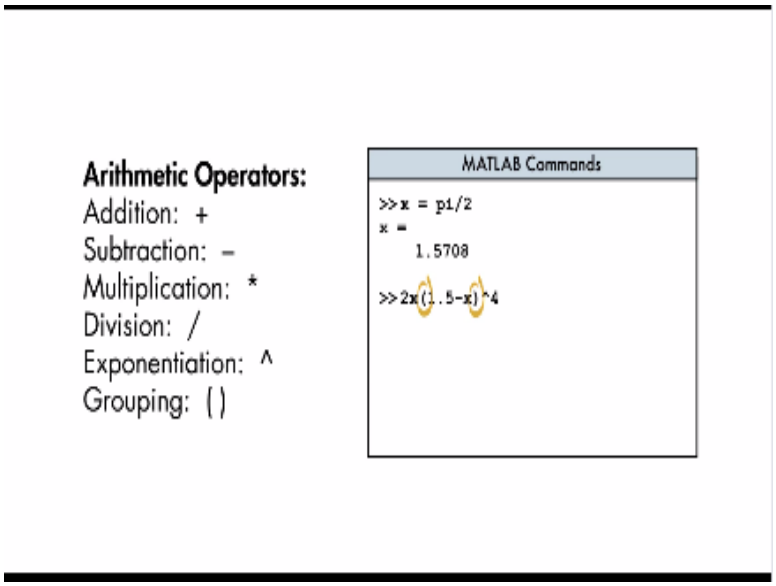

Let us look at these building blocks before combining them into a single expression we perform calculations by entering the corresponding mathematical expression using these common operators. By default a non-integer result is shown to four decimal places though the stored result contains more precision. We enter more complex formulas by using parentheses to group terms.

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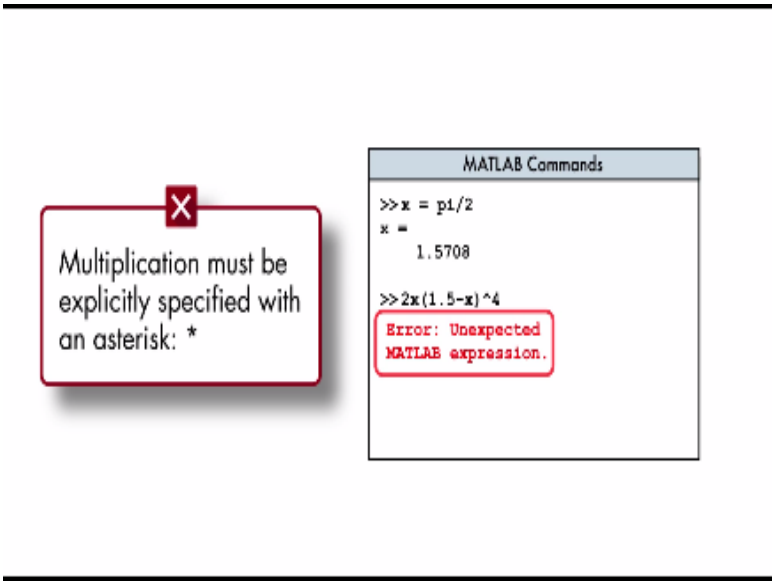

Be sure to use an asterisk to indicate multiplication or you will get an error like this one that is better.

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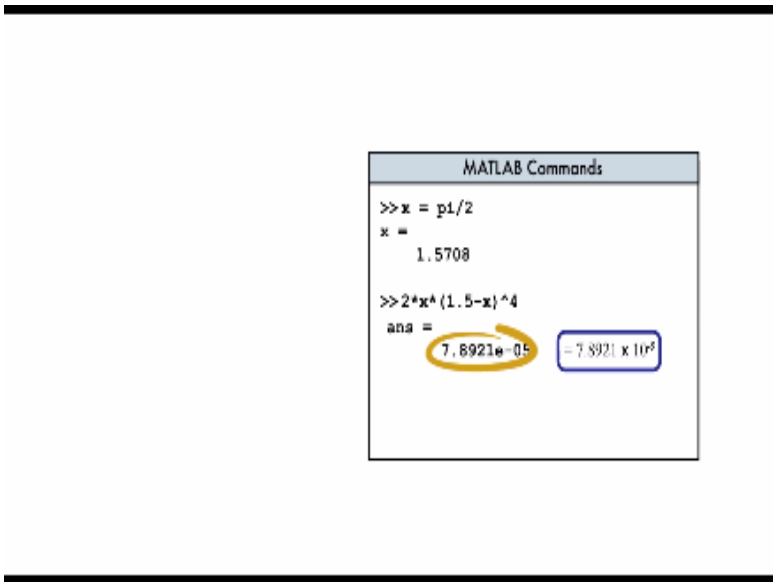

Notice that calculations that produce a very large or very small number are displayed using scientific notation.

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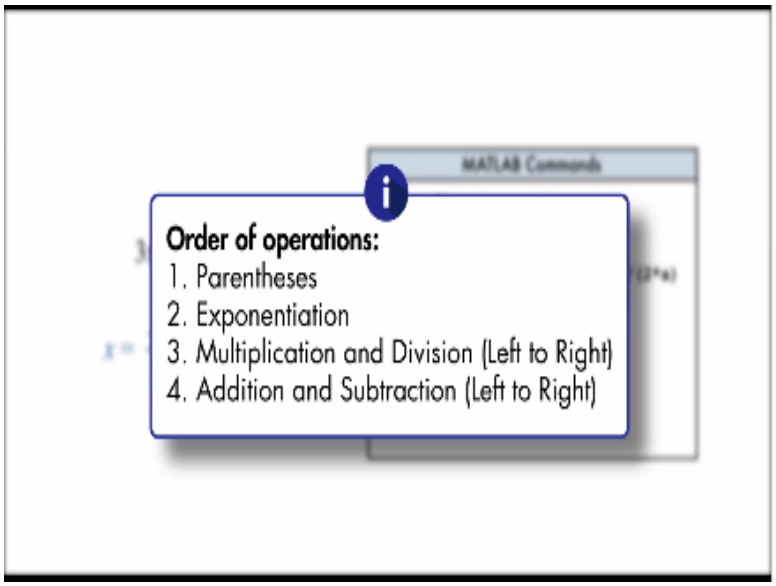

Now that we know the basics were ready to calculate those roots we were after. Let us define variables a, b and c so that the MATLAB expression more closely matches the mathematical formula. Next, we enter the formula for the first route while this expression may appear correct at first it does not produce the intended result. Because MATLAB calculations follow the order of operations we actually entered this expression.

So -b is no longer part of the fraction and a is not in the denominator to get the correct result we need to add the parentheses shown to group the numerator and denominator together. It is helpful to have a good understanding of the order of operations so that we know when to group terms with parentheses.

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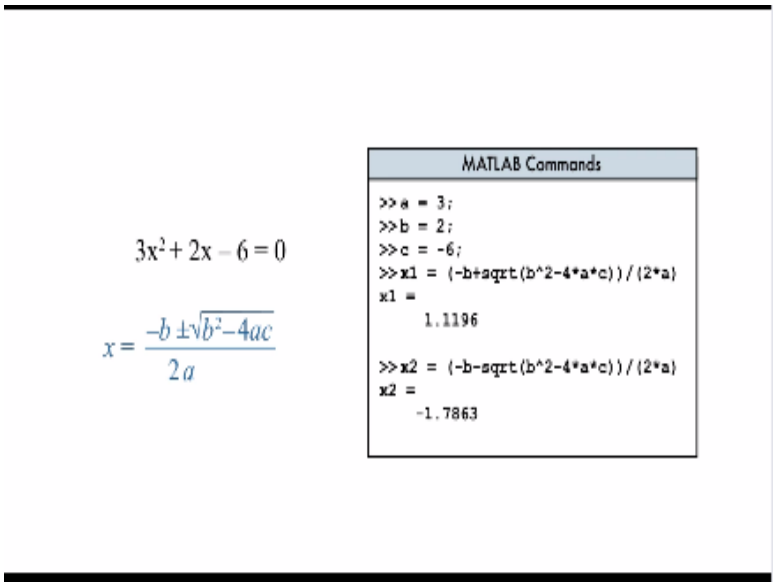

Neither, we have got the first root we only need to change the plus sign to a minus sign to get the second root and just like that we were done.

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