Assignment 9

The purpose of this assignment is to understand the symbolic toolkit and how it makes everyday mathmatical problems highly feasable and solvable!

In order to use the symbolic toolkit you must have it installed, this should not be a problem since it came with the free trial.

Submit as a **.mlx** file. Please use the Live Editor!

0.1 Research

We will need to simplify our answers and be able to solve them. Reasearch the following under the symbolic toolkit in MATLAB as you will be using them in section 2:

1. simplify(variable)
2. simplify(variable, 'Maxdegree', maxpolynomial degree)
3. simplifyFraction(variable)
4. expand(variable)
5. solve(expression, variable you want to solve for)

Also note that you may stack these functions after another. It is important to know that they effect the overall answer by the order and combinatuion you use them.

0.2 Solving for x

If the problem is equal to y, solve for the variable x for y = 0. If the answer is set to z, the answer will be simplified (do not solve for x!). In the following problems, let a, b, c, and d be arbitrary symbols. **I want all answers simplified and expanded, and Fractions simplified.** It helps if you work it out on paper to!

Each problem is worth 25 points so play close attention!

$$y = ax^2 + bx + c \tag{1}$$

$$y^2 = \frac{30a - x^2}{x^{1/2} - 3} \tag{2}$$

$$z = sin^2(x) + cos^2(x) \tag{3}$$

$$z = (cos(2x) + sin(3x))^2 \tag{4}$$

$$y = ax^3 + bx^2 + cx + d \tag{5}$$

$$y = \frac{x}{12312} - \frac{x}{121423534} \tag{6}$$

Note: Notice how easy it is to use in MATLAB rater than by hand. Sometimes not everything can be solved by hand and the only way to solve an expression is with a computer.