Applied Data Analysis and Tools
Symbolic Math Homework

Use the MATLAB Symbolic Math Toolbox functions to complete the following math problems. Complete the assignment on MATLAB Grader.

1. Use the **expand** function to express this product of polynomials as a single polynomial: $(x^2 + 5x + 6)(x - 4)(4x + 9)$.

2. Factor the following polynomial to find its roots: $x^3 - 3x^2 - 13x + 15$

3. Simplify the following equation: $(\cos(x) + \sin(x))(\cos(x) + \sin(x))$

4. Find the values of x that satisfy $3x^2 - 8x + 5 = 0$

5. Find the derivative with respect to x of

$$f(x) = \frac{x^3 + 7x + 1}{x^3 - x}$$

6. Find the derivative with respect to x of

$$f(x) = x^2 \cos(x)$$

7. Calculate the definite integral

$$\int_0^4 2\pi\, x \left(2 - \sqrt{x}\right) dx$$

8.

$$\int \frac{1 + \cos(x)}{\sin^2(x)} dx$$

9.

$$\lim_{x \to 2} \frac{x^2 - 4}{x - 2}$$