Math 4710 HOMEWORK #4 Name:

Due 2/24/2023, 10:30 a.m., before start of the class

Solve the following problems and staple your solutions to this cover sheet.

1. Sec 2.3 #3(d)
   Notes: Find the constants. You may use the Review, Identities, Theorems, Formulas and Tables hand-out and Mathematica!

2. Sec 8.2 #1(d)
   Hints: $u_E'' = -1$. You may use results of an earlier problem!

3. Sec 2.4 #1(a)
   Notes: Find the constants. You may use the Review, Identities, Theorems, Formulas and Tables hand-out and Mathematica!

4. Sec 8.2 #1(c)
   Hint: Can use $u_E(x) = Ax$! You may use results of an earlier problem!

5. Sec 8.2 #1(f)
   Hints: $u_E(x) = \frac{L^2}{4k\pi^2} \sin \frac{2\pi x}{L} - \frac{L}{2k\pi} x$. You may use results of an earlier problem!

6. Sec 2.4 #2* Change the B.C.'s of problem 2.4.2 to $u(0, t) = 0$ and $\frac{\partial u}{\partial x}(L, t) = 0$.
   Hint: You may use the Review, Identities, Theorems, Formulas and Tables hand-out.

7. Sec 8.2 #1(a)
   Hint: You may use results of an earlier problem!

8. Sec 8.2 #1(b)
   Hints: There is no equilibrium solution! In addition to showing this mathematically, try to give a physical reason for it. Find a reference function $r(x)$ such that $r'(0) = 0$ and $r'(L) = B$. In this case, you are asked to only reduce the problem to a one with homogeneous boundary conditions.

9. Sec 8.2 #2(b)

10. Free points!