Math 2280                 HOMEWORK #4          Name:

Due 2/2/2024, 9:30 A.M.

Solve the following problems and staple your solutions to this cover sheet. (Computer outputs must be put in the appropriate place in the solution, not attached as an appendix. You may physically cut and paste the output in the problem or allow appropriate space in the printout to add your hand written work.)

1. Sec 2.2 #21   Hint: To integrate use integration by parts.

2. Find the general solution of $y'' + 2\,x^{-1}y' = 0$. Hints: Let $u = y'$. Then $y'' = u'$. See your class notes.

3. Sec 2.3 #10

4. Sec 2.3 #17

5. Sec 2.3 #25(a)   Hint: $\frac{d}{dx}[\int_2^x e^{t^2}\,dt] = e^{x^2}$.

6. Sec 2.4 #12

7. Sec 2.4 #22

8. Sec 2.5 #8

9. Sec 2.5 #11

10. Solve $\dfrac{dy}{dx} = \dfrac{2x - 2xy}{1 + x^2}$ using the technique associated with each of the three types of the equations this ODE belongs to: (a) First order linear equation, (b) Separable equation, and (c) Exact equation. Note: Obviously, you should get three equivalent, if not exactly the same, answers. Show this!