Math 2280 HOMEWORK #12 Name:

Due 4/13/2026, 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 8.3 #18
   Hint: $a_2 = \frac{1}{6}a_0$ and $a_{n+2} = \frac{2n}{3(n+2)}a_{n+1} - \frac{n-1}{3(n+2)(n+1)}a_n$. It turns out that $y_2 = a_1 x$.
2. Sec 8.3 #26
3. Sec 8.4 #3
4. Sec 8.4 #9
   Hint: $y = \sum_{n=0}^{\infty} a_n (x-1)^n$ and use $x^2 - 2x = (x-1)^2 - 1$.
5. Sec 8.4 #15
   Hint: $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$. It is sufficient to use the first four nonzero terms of the series.
6. Sec 8.5 #6
7. Sec 8.5 #13
8. Sec 8.5 #16
9. Sec 6.1 #8
   Hint: Functions $f_1$, $f_2$ and $f_3$ are linearly dependent iff $k_1 f_1(x) + k_2 f_2(x) + k_3 f_3(x) = 0$, for all $x$, with $k_1$, $k_2$ and $k_3$ constants and **not all zero**.
10. Free points!
11. Free points!
12. Free points!