

Due 4/14/2025, 8:30 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 #5

Hint: $p(t) = \frac{1}{t-2}$ and $q(t) = -\frac{1}{t+1}$.

2. Sec 8.3 #15

Hint: $(2a_2 - a_1 + a_0) + \sum_{n=1}^{\infty} [(n+2)(n+1)a_{n+2} + na_n - (n+1)a_{n+1} + a_n]x^n = 0$

3. 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 $y_2 = a_1x$.

4. Sec 8.3 #26

5. Sec 8.4 #3

6. Sec 8.4 #9

Hint: $y = \sum_{n=0}^{\infty} a_n(x-1)^n$ and use $x^2 - 2x = (x-1)^2 - 1$.

7. 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.

8. Sec 8.5 #6

9. Sec 8.5 #13

10. Sec 8.5 #16

11. Free points!

12. Free points!