

Answers to even-numbered problems of Homework 11

April 7, 2007

5.1

#18. Two solutions are:

$$y_1 = 1 - \frac{1}{12}x^4 + \frac{1}{672}x^8 - \dots$$

and

$$y_2 = x - \frac{1}{20}x^5 + \frac{1}{1440}x^9 - \dots$$

#24. Two solutions are:

$$y_1 = c_0\left[1 + \frac{1}{4}x^2 - \frac{1}{24}x^3 + \frac{1}{480}x^5 + \dots\right]$$

and

$$y_2 = c_1x$$

5.2

#6. Irregular singular point: $x = 5$; Regular singular point: $x = 0$.

#18. The general solution on $(0, \infty)$ is

$$y = C_1x^{1/2}\left(1 - \frac{1}{6}x^2 + \frac{1}{168}x^4 + \dots\right) + C_2x\left(1 - \frac{1}{10}x^2 + \frac{1}{360}x^4 + \dots\right).$$