Answers(not in textbook) for Assignment 7

14.2(b)

$$y = c\tan^{-1} x$$

14.6

$$3x^4 + 3y^2x^2 + 2x^3 = c$$

14.24

(a)

$$y = x\ln x - x$$

(b)

$$y = \tan x + \sqrt{2}\sec x$$

14.30

$$y = \sin^{-1} x$$

Answers(not in textbook) for Assignment 8

15.04

$$f(t) = \frac{1}{4}\left(e^{-t} + \left[(4\lambda - 2)t - 1\right]e^{-3t}\right)$$

15.10

(a)

$$f(t) = 2e^{-3t} - e^{-2t}$$

(b)

$$f(t) = e^{-t}\left[\cos 2t - \frac{1}{2}\sin 2t\right]$$

15.24

(a)

$$y(x) = Ae^{x} + Be^{-x} - (x^{n}\cosh x - nx^{n-1}\sinh x + n(n-1)x^{n-2}\cosh x + ...)$$

(b)

$$y(x) = \left(A + Bx + \frac{x^{3}}{3}\right)e^{x}$$

EP-1

$$y_2(x) = x\ln x + x\sum_{n=1}^{\infty}\frac{(-1)^{n}x^{n}}{n \cdot n!}$$

EP-2

$$y_1(x) = e^{-5x} \quad , \quad y_2(x) = e^{-x}$$

$$y_p(x) = \frac{1}{4}\left(\frac{8}{13}\sin x - \frac{12}{13}\cos x + \frac{4}{5}x^{2} - \frac{48}{25}x + \frac{248}{125}\right)$$

EP-3

$$u(x) = \frac{2}{255}\left(22e^{-2x} - 13e^{-5x}\right) + \frac{1}{85}\left(6\cos 2x + 7\sin 2x\right)$$

EP-4

$$u(x) = c_1x^{4} + \frac{c_2}{x} - \frac{1}{5x}\cos x - \frac{1}{5}\sin x + \frac{x^{4}}{5}\int\frac{\cos x}{x^{4}}dx$$

Answers(not in textbook) for Assignment 9

EP-5

$$y(x)=Ax^{1/6}\left[1+\frac{3}{32}x^2+\frac{9}{5120}x^4+....\right]+Bx^{5/6}\left[1+\frac{3}{64}x^2+\frac{9}{14336}x^4+....\right]$$

EP-6

(b)

$$u(x)=b_0\left[1-2x^2+\frac{1}{3}x^3-....\right]+b_1\left[x-\frac{2}{3}x^3-\frac{1}{15}x^5+....\right]$$

(c)

$$u(x)=x-\frac{1}{12}x^3+\frac{1}{240}x^5-\frac{1}{2240}x^7+....$$

EP-7

(a)

$$u_1(x)=1+x+\frac{1}{6}x^2+\frac{1}{18}x^3+.......$$

$$u_2(x)=1+\frac{1}{6}x+\frac{1}{24}x^2+\frac{17}{1344}x^3+.......$$

(c)

$$u_1(x)=x^{2/3}\left(1-\frac{1}{4}x+\frac{5}{112}x^2+.......\right)$$

$$u_2(x)=x^{1/3}\left(1-\frac{1}{4}x+\frac{1}{20}x^2+.......\right)$$

EP-8

$$u_1(x)=e^x$$

$$u_2(x)=\ln x-x+\frac{1}{4}x^2-\frac{1}{18}x^3+...........$$

EP-9

Bessel's equation: $u(x)=c_1J_{1/3}(x)+c_2J_{-1/3}(x)$

EP-10

(a)

$$\left(\frac{1}{x}-\frac{12}{x^3}\right)J_1(x)+\frac{6}{x^2}J_0(x)+C$$

(b)

$$3x^2J_1(x)-\left(x^3+3x\right)J_0(x)+3\int J_0(x)dx$$