

EXTRA CREDIT HOMEWORK 4, COURSE 267, FALL 2004

Problem 1. Consider the initial value problem

$$y^{(4)} + y'' = 2\cos(x), y(0) = -2, y'(0) = 1, y''(0) = y^{(3)}(0) = 0.$$

A) $y(\pi) = \pi - 2$. **B)** $y(\pi) = 2\pi$. **C)** $y(\pi) = -\pi - 3$. **D)** $y(\pi) = -\pi + 3$. **E)** $y(\pi) = 2\pi + 2$. **F)** None of above

Problem 2. Consider the initial value problem

$$y^{(3)} - y' = 0 \quad y(0) = 3, \quad y'(0) = -1, \quad y''(0) = 1.$$

A) $y(1) = 2 - e$. **B)** $y(1) = 2 + e$. **C)** $y(1) = 2 - \frac{1}{e}$. **D)** $y(1) = 2 - \frac{2}{e}$. **E)** $y(1) = 3 - e$. **F)** None of above.

Problem 3. Consider the initial value problem

$$y^{(3)} - 3y' - 2y = 9e^{2x}, y(0) = 0, y'(0) = -3, y''(0) = 3$$

A) $y(1) = 0$. **B)** $y(1) = e$ **C)** $y(1) = e - e^2$. **D)** $y(1) = 2(e - e^2)$. **E)** $y(1) = 3(e - e^2)$. **F)** None of above.

Problem 4. Consider the initial value problem

$$y^{(4)} - y = 0, \quad y(0) = y'(0) = y''(0) = y^{(3)}(0) = 1.$$

A) $y(1) = -2e$. **B)** $y(1) = 2e^2$ **C)** $z(1) = 3e + \cos(1)$. **D)** $z(1) = \cos(1) + 2\sin(1)$. **E)** $y(1) = e + \frac{1}{2}\sin(1)$. **F)** None of above.

Problem 5. Consider the initial value problem

$$y^{(4)} + 16y = 0 \quad y(0) = 1, y'(0) = -2, y''(0) = 4, y'''(0) = -8.$$

A) $y(1) = -2e$. **B)** $y(1) = e$ **C)** $y'(1) = -2e$. **D)** $y''(1) = 4e$. **E)** $y(2) = e^2$. **F)** None of above.