系 所 別：電機工程研究所　　　　　　　　組 別：光電組

考科代碼：2232　　　　　　　　　　　　考 科：工程數學

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1. (10%) Solve $y'' = 3$.

2. (10%) Solve $y' = e^x$.

3. (10%) Solve $y' = 5y$.

4. (10%) Solve $y' = x$.

5. (10%) Solve $y' = \cos 2x$.

6. (10%) Graph the following function $f(x)$, which is assumed to be periodic of period 2.

$$f(x) = \begin{cases} 0 & if \quad -1 < x < 0 \\ x & if \quad 0 < x < 1 \end{cases}.$$

7. (10%) Evaluate $\int_0^\pi \sin x\,dx$.

8. (10%) Find the Fourier series of the following function $f(x)$, which is assumed to have the period 2π.

$$f(x) = \begin{cases} 0 & if \quad -\pi < x < 0 \\ 1 & if \quad 0 < x < \pi \end{cases}.$$

9. (10%) Evaluate $\int_0^1 x\,dx$.

10. (10%) Plot the graph of the function $f(x) = \cos x$ for $-\pi < x < \pi$.