

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (15%) Find the derivative for $f(x) = \sqrt{x + \sqrt{x + \sqrt{x}}}$

2. (15%) Evaluate the integral for $\int \frac{1}{x \ln x \ln \ln x} dx$

3. (20%) Find the area of the region in the first quadrant bounded by the graph of the equation $y = \sin x / (1 + \cos x)$, the x axis and the line $x = \pi/2$.

4. (15%) Find the volume for $\int_0^r dy \int_0^y \sqrt{r^2 - y^2} dx$

5. (15%) Find the volume of the solid bounded above by the paraboloid $z = 4 - x^2 - y^2$ and below by the plane $z = 4 - 2x$.

6. (10%) Find the derivative for $f(x) = \frac{x-1}{x^2-2x+2}$

7. (10%) Evaluate the integral for $\int_{-2}^4 (|x-1| + |x+1|) dx$