جامعة الملك سعود King Saud University	**Midterm 1 – Math 228- semester 1- 1447H** **Time: 1h 30 min**

Question 1:(2+2+2+2=8 marks)

1) **Find the average value of the function** $f(x) = \frac{1}{x} + 1$ **on the interval** $[1, e]$

2) **Find the derivative of** $F(x) = \int_{2x}^{secx} \sqrt{t^2 - 1}\, dt$

3) **Find the area of the region bounded by the graphs of**
$y = x^2$ *and* $y = -x + 2$

4) **Find the volume of the solid generated by revolving the region bounded by the graphs of** $y = x^2$ *and* $y = 2x$ **around the x- axis.**

Question 2: Evaluate the following integrals (17 mark)

1) $\int \frac{1}{cos^2(\frac{x}{2})} dx$ (2)

2) $\int x\, e^{2x}\, dx$ (2)

3) $\int tan^3(x)\, sec^3(x)\, dx$ (3)

4) $\int \frac{1}{x^2\sqrt{9-x^2}}\, dx$ (3)

5) $\int \frac{1}{x\sqrt{(ln\, x)^2 - 1}}\, dx$ (2)

6) $\int \frac{x+3}{x^2+3x+2}\, dx$ (3)

8) $\int \frac{1}{1-cos\, x} dx$ (2)