جامعة الملك سعود
King Saud University

MATH 111- First Midterm Exam- Semester 1- 1447H

Time: 1h 30 min

Instructions: Calculators are **not** allowed.

Question 1 (3+2 Marks):

1. Use Riemann sum to evaluate the definite integral $\int_{-1}^{1}(3x^2+2)dx$.

2. Find $F'(0)$, if $F(x)=\int_{\cos(\sqrt{x+1})}^{e^{x^2}}\frac{1}{1-t^2}dt$.

Question 2 (2+2 Marks): Find $\frac{dy}{dx}$ if

1. $y(x)=\cos^{-1}(\frac{1}{2^{3^x}})+x^2\log_2(\sqrt[5]{x^4+2})$.

2. $y(x)=(\sin x)^{\sqrt{x}}$.

Question 3: Evaluate the following integrals (2 Marks for each integral)

1. $\int\frac{x^2+4}{\sqrt[3]{x}}dx$.

2. $\int\frac{\cos x}{(1+\sin x)^4}dx$.

3. $\int\frac{\sec(x^{\frac{2}{5}})\tan(x^{\frac{2}{5}})}{x^{\frac{3}{5}}}dx$.

4. $\int\frac{1}{\sqrt{x}(1+\sqrt{x})}dx$.

5. $\int_0^1\frac{x}{x+1}dx$.

6. $\int\ln x\, e^{-\ln(2x)}dx$.

7. $\int\frac{1}{e^{-x}+e^x}dx$.

8. $\int\frac{2^x}{\sqrt{4^{2x}-9}}dx$.