MATH 111

يمنع منعا باتا استخدام الآلة الحاسبة

King Saud University **Second midterm exam 1433H**
Science and Medical Studies Section for girls **1 ½ hours**
Dept. of Mathematics

Name:	**Student No.:**
Teacher's Name:	**Sequence No.:**

Question No.	**I**	**II**	**III**	**IV**		**Total**
Mark						

Question I

A- Choose the correct answer

1. If $x = 5^y$, then $\frac{dy}{dx}$ is equal to:

i. $\frac{\ln x}{\ln 5}$ ii. $\frac{1}{x \ln 5}$ iii. $\frac{x}{\ln 5}$ iv. None of the previous.

2. If $f(x) = \tanh^{-1}(5x)$ then $\frac{df}{dx}(0)$ is equal to:

i. 5 ii. 25. iii. 1 iv. None of the previous.

3. The expression $\cosh^2(3x+1) - \sinh^2(3x+1)$ is equal to :

i. $3x+1$ ii.. -1 iii. 1 iv. None of the previous.

B- Approximate the integral $\int_0^2 (2x^2 - 1)dx$ using the trapezoidal rule with n = 4.

Question II. Prove that $\sinh^{-1} x = \ln(x + \sqrt{x^2 + 1}\ )$, $x \in \square$

Question III

A- Solve $\log_9(2x+5) - \log_9(x+1) = 1$

B. Find $\frac{dy}{dx}$, if $y = \ln\sqrt{\frac{x^3}{x^5+1}}$

Question IV: Evaluate the following integrals

1. $\int \sin^{-1} x dx$

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

3. $\int \sqrt{\sin x}\ \cos^3 x\ dx$

4. $\int_1^3 \frac{dx}{x^3 + x}$

5. $\int \frac{3}{8 - 4x + x^2}\ dx$