Prince Sultan University

MATH 211

Second Major Exam

Term 082, 2008/2009

Saturday, 6th June 2009

Dr. Aiman Mukheimer

Time Allowed: 90 minutes

Name: _____ _____ _____

(First) (Middle) (Last)

ID Number: _____

Serial No.: _____

Important Instructions:

- You may use CASIO scientific calculator that does not have programming or graphing capabilities.
- You may **NOT borrow** a calculator from anyone.
- There should be **NO talking** during the examination.
- Your exam will be taken **immediately** without any warning if your mobile is seen or heard
- You must show all your work beside the problem. Be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.
- This examination has **14** problems, some with several parts. Make sure that your paper has all these problems

Problems	Max points	Student's Points
1,2,3	14	
4,5,6,7	16	
8,9,10,11	15	
12,13,14	15	
Total	60	

Q1. (3 points) Evaluate the limit: $\lim_{x\to\infty} \frac{x^4+2x^2-3}{x^5}$

Solution:

Q2. (4 points) Find A and B so that the graph of $f(x)=\frac{1-Ax}{Bx+7}$ has y = 7 as a horizontal asymptote and x = 2 as a vertical asymptote

Solution:

Q3. (7 points) Sketch the graph of the function $f(x)=\frac{1}{2x+4}$

Q4. (4 points) Find the absolute maximum and absolute minimum of $f(x) = x^4 - 2x^2 + 10$ on the interval $-4 \le x \le 2$.
Solution:

Q5. (4 points) If $2,000 is invested at 7 percent compounded monthly, what is the balance after 8 years?
Solution:

Q6. (4 points) Solve for x: $2\ln x - \frac{1}{3}\ln x^2 = 4$
Solution:

Q7. (4 points) Records indicate that t weeks after the outbreak of a disease, approximately $Q(t) = \frac{70}{3 + 52e^{-1.3t}}$ thousand people have been infected. At what rate was the disease spreading at the end of the third week?
Solution:

Q8. (4 points) Find the derivative of $\ln\left[\left(\ln x^2\right)^5\right]$.

Solution:

Q9. (3 points) Evaluate $\int\left(e^{-3x}+\frac{5}{x}\right)dx$.

Solution:

Q10. (3 points) Evaluate $\int x^3\left(2x+5-3\sqrt{x}\right)dx$

Solution:

Q11. (5 points) Evaluate $\int\left(\frac{x}{5}-7\right)^{2/5}dx$

Solution:

Q12. (3 points) Find the function whose tangent line has the slope $3x^2 + 1$ for each value of x and whose graph passes through (0, 2).
Solution:

Q13. (6 points) Evaluate $\int_{-1}^{3}(3x-5)^4\,dx$. Express your answer as a decimal. Approximate to one decimal place.
Solution:

Q14. (6 points) Determine the area of the region bounded by the curves:

$y = 1 + 4x - x^2$ and $y = 1 + x^2$.

Solution: