Prince Sultan University
Orientation Mathematics Program
MATH 001
Midterm Examination
Semester II, Term 062
Saturday, March 31, 2007
Time Allowed: 100 minutes

Student Name: _____

Student ID #: _____ Section #: _____

Teacher's Name: _____

Important Instructions:

1. You may use a scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. There should be NO talking during the examination.
5. Your exam will be taken immediately if your mobile phone is seen or heard
6. Looking around or making an attempt to cheat will result in your exam being cancelled
7. Provide an organized complete solution for each Question.
8. This examination has 16 problems. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1,2	15	
3,4,5,6	18	
7,8,9,10	25	
11,12,13	21	
14,15,16	21	
Total	100	

Provide a complete solution for the following Questions:

Q1.(12 points) Simplify each of the following expressions to the simplest form:

i) $14x^2 + 5 - [7(x^2 - 2) + 4]$

ii) $\left(-7xy^4\right)^{-2}\left(\frac{-2}{9}x^5y^6\right)^0$

iii) $\frac{80\,x^{12}y^{-2}}{5\;x^{16}y^{-4}}$

iv) $\left(\frac{-15a^4b^2}{5\,a^{10}b^{-3}}\right)^3$

Q2.(3 points) Rationalize the denominator of $\frac{12}{\sqrt{17}-\sqrt{5}}$ and simplify.

Q3.(6 points) Evaluate the following expressions:

i) $\sqrt[3]{-125}$

ii) $\sqrt[6]{\frac{1}{64}}$

iii) $32^{\frac{-4}{5}}$

Q4.(4 points) Simplify using properties of exponents: $\frac{(3y^{\frac{1}{4}})^3}{y^{\frac{1}{12}}}$

Q5.(4 points) add or subtract terms whenever possible $3\sqrt{8} - \sqrt{32} + 3\sqrt{72} - \sqrt{75}$

Q6.(4 points) Simplify: $\frac{\frac{3}{x-2} - \frac{4}{x+2}}{\frac{7}{x^2-4}}$

Q7.(12 points) Find the product of the following and simplify

i) $(8x^4 + 3x)(9x^3 - 5)$

ii) $(3x - 4)^3$

iii) $(x - y)(x^2 + xy + y^2)$

Q8. (5 points) Perform the indicated operations and simplify:

$$\frac{x^2 + x - 12}{x^2 + x - 30} \cdot \frac{x^2 + 5x + 6}{x^2 - 2x - 3} \div \frac{x + 3}{x^2 + 7x + 6}$$

Q9.(4 points) Find all numbers that must be excluded from the domain of the rational expression:

$$\frac{x - 1}{x^2 + 11x + 10}$$

Q10.(4 points) Solve: $5 - 12x = 8 - 7x - [6 \div 3(2 + 5^3) + 5x]$

Q11.(4 points) Graph $y = -2|x|$ using the integers between $x = -3$ and $x = 3$.

Q12.(12 points) Factor and simplify the following expressions completely.

i) $3x^3 - 2x^2 - 6x + 4$

ii) $6x^2 + 19x - 7$

iii) $(x+5)^{\frac{-1}{2}} - (x+5)^{\frac{-3}{2}}$

Q13. (5 points) Find the solution set: $\frac{3}{2x-2} + \frac{1}{2} = \frac{2}{x-1}$

Q14.(4 points) Evaluate $x^2 - 2x + 2$ for $x = 1 + i$

Q15.(12 points) Perform the indicated operation(s) and write the result in the standard form $a + ib$ for:

i) $(8 - 4i)(-3 + 9i)$

ii) $(2 + 3i)^2$

iii) $\dfrac{9 - 3i}{5 + i}$

iv) $\sqrt{-8}\ (\sqrt{-3} - \sqrt{5})$

Q16.(5 points) Find all values of x such that $y = 0$ for $y = \dfrac{1}{5x + 5} - \dfrac{3}{x + 1} + \dfrac{7}{5}$