



Prince Sultan University
Orientation Mathematics Program

MATH 001

Midterm Examination

Semester I, Term 081

Sunday, November 30, 2008

Time Allowed: 90 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 12 problems. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1	12	
2, 3	22	
4	16	
5, 6, 7	18	
8, 9, 10	13	
11,12	19	
Total	100	

1. (12 points) Simplify each of the following expressions

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

ii. $(125x^9y^6)^{1/3}$

iii. $\left(\frac{x^4y^5z^6}{x^{-4}y^{-5}z^{-6}} \right)^{-4}$

iv. $\frac{\sqrt[4]{162x^5}}{\sqrt[4]{2x}}$

2. (6 points) Evaluate the following:

i. $\sqrt[3]{\sqrt[4]{16} + \sqrt{625}}$

ii. $\frac{|x|}{x} - \frac{|y|}{y}$ for $x = 2$ and $y = -5$.

3. (16 points) Factor each of the following completely

i. $81x^4 - 1$

ii. $2x^2 + 5x - 3$

iii. $(x^2 + 3)^{-2/3} + (x^2 + 3)^{-5/3}$

iv. $x^2y - 16y + 32 - 2x^2$

4. (16 points) Perform the indicated operations and simplify:

i. $3\sqrt{54} - 2\sqrt{24} - \sqrt{96} + 4\sqrt{63}$ (Note: Show all your steps)

ii. $(x + 9y)(6x + 7y)$

iii. $(7x^4y^2 - 5x^2y^2 + 3xy) + (18x^4y^2 - 6x^2y^2 - xy)$

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

5. (3 points) Find all numbers that must be excluded from the domain of $\frac{x-3}{x^2+4x-45}$.

6. (3 points) Rationalize the denominator of: $\frac{11}{\sqrt{7}-\sqrt{3}}$. (Note: Show all your steps)

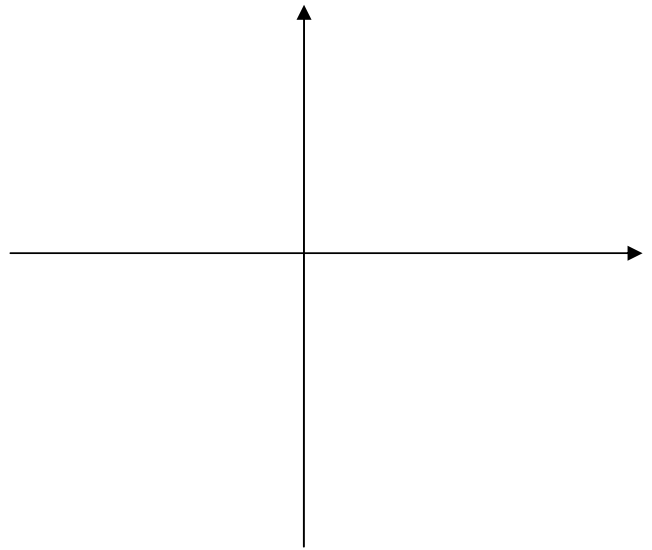
7. (12 points) Solve the following inequalities. Express the solution using interval notation.

i. $-4(x+2) > 3x+20$

ii. $-6 \leq \frac{1}{2}x - 4 < -3$

iii. $\left| 3 - \frac{2}{3}x \right| > 5$

8. (5 points) Graph $y = 2x^2 - 4$. Determine the x – intercept and the y – intercept.



9. (4 points) Write the expression $\sqrt{-8}(\sqrt{-3} - \sqrt{5})$ in the standard form of a complex number. (Note: Show all your steps)

10. (4 points) Evaluate $\frac{x^2 + 11}{3 - x}$ for $x = 4i$.

11. (15 points) Find the solution set of each equation

i. $3(x-4)^2 = 15$

ii. $x^2 + 4x + 1 = 0$

iii. $\sqrt{2x+15} - 6 = x$

12. (4 points) Given $y_1 = \frac{x+1}{4}$ and $y_2 = \frac{x-2}{3}$. Find all values of x satisfying $y_1 - y_2 = -4$.