



Prince Sultan University
Orientation Mathematics Program

MATH 001

Midterm Examination

Semester II, Term 072

Wednesday, March 26, 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 11 problems. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1,2,3	20	
4,5	20	
6,7	20	
8,9	16	
10	12	
11	12	
Total	100	

1. (4 points) Evaluate $\frac{6-3|x-2|}{||-2|-1|}$ for $x = -3$.

2. (4 points) Find $(\{1,2,3,4,5\} \cap \{7,6,5,4\}) \cup \{4,2,1\}$

3. (12 points) Simplify each of the following exponential expressions. (write all expressions without negative exponents)

(i) $(6x^4)^2$

(ii) $(2xy^{-2})(-2x^{-1}y)$

(iii) $(25x^4y^6)^{1/2}(32)^{-4/5}$

4. (8 points) Simplify each of the following radical expressions.

(i) $x\sqrt[3]{x} - 4\sqrt[3]{x^4}$

(ii) $\left(\frac{\sqrt[3]{54x^4}}{\sqrt[3]{2x^{-2}}} \right) - 5x^2$

5. (12 points) Perform the indicated operations and simplify.

(i) $(2 - y^5)(2 + y^5)$

(ii) $(x - 2)^3$

(iii) $3(x^5 - 4x^2 + 3x + 6) - 2(x^3 + 9x^2 - 3)$

6. (16 points) Factor each of the following completely.

(i) $7x^4 - 7$

(ii) $x^3 - 3x^2 + 4x - 12$

(iii) $x^3 - 27$

(iv) $10(x+1)^{-1} - 2(x+1)^{-2}$

7. (4 points) Rationalize the denominator of $\frac{4}{3\sqrt{2}-4}$. (Show your Steps)

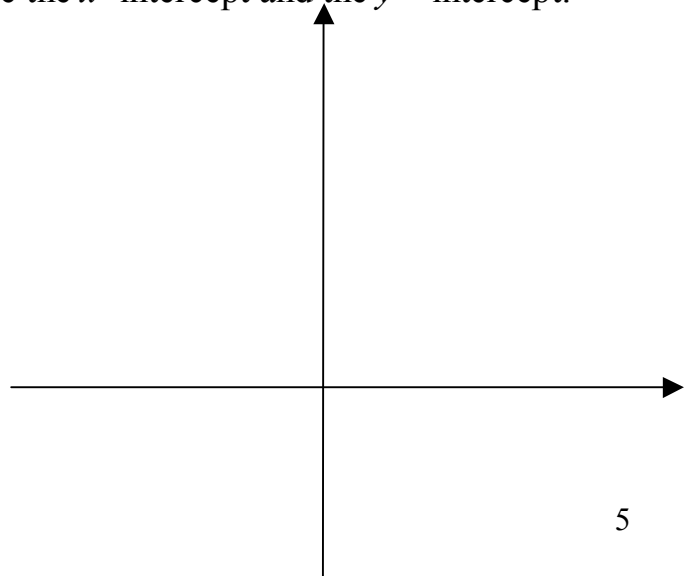
8. (12 points) Simplify each of the following rational expressions.

(i) $\frac{4x^2 + 10}{x - 3} \div \frac{6x^2 + 15}{x^2 - 9}$

(ii) $\frac{\frac{x}{4} - 1}{x - 4}$

(iii) $\frac{3x}{x^2 + 3x - 10} - \frac{2x}{x^2 + x - 6}$

9. (4 points) Graph $y = 8 + x^3$. Determine the x -intercept and the y -intercept.



10. (12 points) Find the solution set of each equation.

(i) $2(x - 1) + 3 = x - 3(x + 1)$

(ii) $2x - \frac{2x}{9} = \frac{x}{6} + \frac{1}{3}$

(iii) $\frac{x}{x + 3} - \frac{x}{x - 3} = \frac{1}{x^2 - 9}$

11. (12 points) Write each of the following in the standard form of a complex number. **Show all your steps**

(i) $\frac{i^2 \sqrt{-8}}{5-i}$

(ii) $(3\sqrt{-5})(-4\sqrt{-12})$

(iii) $(3+5i)(-4-2i)$