Prince Sultan University
Orientation Mathematics Program
MATH 001
Midterm Examination
Semester I, Term 091
Monday, December 7, 2009
Time Allowed: 90 minutes($1\frac{1}{2}$ *hour*)

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. This examination has 13 problems, some with several parts. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1,2,3,4	17	
5,6,7,8	24	
9	16	
10,11	17	
12	16	
13	10	
Total	100	

Show all steps for each question

Q.1 (4 points) Evaluate the algebraic expression for the given values of the variables.

$\dfrac{|y|-7|x|}{6x+xy}$, for $x=-1$ and $y=3$.

Q.2 (2 points) Find the intersection of the two sets.

$\{2,3,5,9\}\cap\{5,11,2\}$

Q.3 (2 points) List all numbers from the given set B that are members of the subset of ***Natural Numbers.***

$B=\left\{6,\sqrt{5},-12,0,0.\bar{1},\sqrt{9}\right\}$

Q.4 (9 points) Simplify each of the following expressions. Assume that all variables represent positive numbers.

(i) $\left(4x^{-4}y^{8}\right)\left(2xy^{6}\right)$

(i) $16x^{2}+2-\left[4\left(x^{2}-6\right)+9\right]$

(iii) $\sqrt{3x}-7\sqrt{27x}+6\sqrt{75x}$

Q.5 (4 points) Rationalize the denominator in $\dfrac{5}{6-\sqrt{3}}$

Q.6 (5 points) Simplify the rational expression. Find all numbers that must be excluded from the domain of the rational Expression

$$\frac{4y^2-7y-2}{y^2-3y+2}$$

Q.7 (8 points) Perform the indicated operations and write the result in *standard form*.

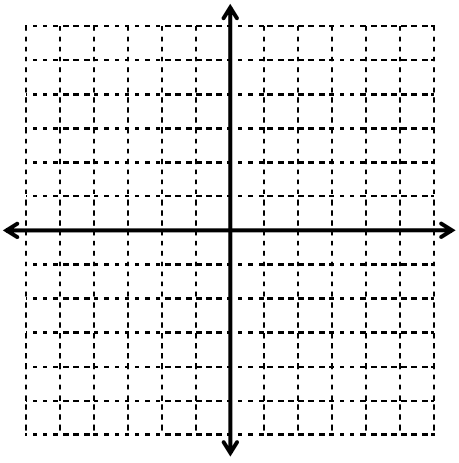
(i) $\left(2-\sqrt{-9}\right)^2$

(ii) $\dfrac{4i}{3-2i}$

Q.8 (7 points) Consider the equation $y=-2x+1$.

(i) Graph this equation. Select integers for x, starting with -2 and ending with 2.

x	-2	-1	0	1	2
y					



(ii) Determine the $x-$intercepts, if any.

(iii) Determine the $y-$intercept, if any.

Q.9 (16 points) Perform the indicated operations and simplify as much as possible.

(i) $\left(5x^4y^2+9x^3y-10y\right)-\left(3x^4y^2+7x^3y+2y-10x\right)$

(ii) $(2x-1)(2x+1)(x^2+3)$

(iii) $\dfrac{x^2-81}{2x-2}\div\dfrac{x^2+18x+81}{x^2+8x-9}$

(iv) $\dfrac{3}{x+2}-\dfrac{x-10}{x^2-4}$

Q.10 (12 points) Factor each of the following **completely**:

(i) $25x^2 - 9$

(iii) $9x^4 - 9x$

(iv) $x^3 + 4x^2 - 16x - 64$

(v) $\left(x^2 + 2\right)^{-\frac{2}{3}} + \left(x^2 + 2\right)^{-\frac{5}{3}}$

Q.11 (5 points) Find all values of x satisfying the given conditions.

$y_1 = \dfrac{x-3}{5}$, $y_2 = \dfrac{x-5}{4}$, and $y_1 - y_2 = -4$

Q.12 (16 points) Solve each of the following equations.

(i) $3(x-4)-4(x-3)=x+3-(x-4)$

(ii) $x^2+x-1=0$

(iii) $(x-1)^{\frac{3}{4}}-8=0$

(iv) $\sqrt{2x+18}=x+5$

Q.13 (10 points) Solve each of the following inequalities and ***graph*** the solution set on a number line. Express the solution set using ***interval notation.***

(i) $9x+1>3(2x+1)+4$

(ii) $3|7-2x|\le 27$