King Fahd University of Petroleum and Minerals
College of Sciences, Prep-Year Math Program

Code 001

Math 001, Exam I
(Term 012)
Sunday, March 17, 2002
6:00-7:50 p.m.

Code 001

Student's Name: _____

ID #: _____ **Section #:** _____

This exam consists of Three parts

Part I: True or False, write your answer in the assigned place on page 1.
Part II: Multiple Choice, write your answer in the assigned place on page 2.
Part III: Written Questions, you must show all necessary steps for full mark.

No Calculators, Pagers, or Mobiles are allowed during this exam.

Question	Points	Student's Score
Part I: (a - g)	14	
Part II: (1 - 5)	15	
Part III: 1	5	
2	3	
3	4	
4	3	
5 (a), (b), (c)	13	
6	5	
7 (a), (b)	8	
8	5	
9 (a), (b)	8	
10	5	
11 (a), (b)	7	
12	5	
Total		
	100	

Math 001, Exam I, Term 012, Code 1

Part I: True or False Questions (2 points each)

Write TRUE or FALSE for the following statement.

a. $5x+5y=5(x+y)$ because of **commutative** property ----------

b. The operation of **Division** by nonzero real numbers is **associative** ----------

c. Every **Natural** number is a **Rational** number ----------

d. The multiplicative inverse of $-4\frac{2}{5}$ is $\frac{5}{22}$ -------

e. 23×10^{-3} is the scientific notation for the number 0.023 -------

f. If R is a notation for the set of all real numbers, Q is a notation for the set of Rational numbers, and H is a notation for the set of Irrational numbers, the $Q\cap R=H$ ---------

g. $\pi=3.14$ ----------

Part II: Multiple Choice Questions (3 points each)

1. If $(y^6 y^{3t})^{\frac{1}{3}} = y$ then t is equal to:

a. -2
b. 2
c. 1
d. -1

2. If $i = \sqrt{-1}$, then $(-i)^{47} + \sqrt{-9}\sqrt{-4}$ is equal to:

a. $-6+i$
b. $-6-i$
c. $6+i$
d. $6-i$

3. The set $\{0.34128....., 2, 0.\overline{35}, \sqrt{5}, -3, -\frac{1}{2}\}$ contains:

a. Three natural numbers
b. Four integers
c. Two irrational numbers
d. Five rational numbers

4. Determine which of the following equations is an **Identity**

a. $2y+7=3(y-1)$
b. $-3(x-5)=-3x+15$
c. $(x+3)^2 = x^2+9$
d. $\frac{x}{x} = 1$ for any real number x

5. The **sum** of the solutions for the quadratic equation $\sqrt{3}x^2 + 3x + \sqrt{2} = 0$ is:

a. $\frac{\sqrt{2}}{3}$
b. $\frac{\sqrt{6}}{3}$
c. -1
d. $-\sqrt{3}$

Part III: Written (Solve the following Questions, show all necessary steps for full credit)

1. Find the value of $\dfrac{-3^2+6\div\sqrt{(-3)^2}-|-3|}{2-\sqrt[5]{(-3)^5}}$ (5 pts)

2. Write without absolute value notation $\big||x-4|-|2x-3|\big|$ if $-3<x<-2$ (3 pts)

3. Find the coefficient of a^2b in the expression $(a-2b)^2(3a-b)$ (4 pts)

4. Rationalize the denominator of $\dfrac{\sqrt{3}+\sqrt{2}}{2\sqrt{3}-3\sqrt{2}}$ (3 pts)

5. Simplify the following expressions:

(a) $\left(\dfrac{(ab)^{-1}c^2}{(ac^{-2})^{-1}b^2}\right)^{-2}$ (4 pts)

(b) $\dfrac{y^2+6y+9}{y^3+27} \div \dfrac{y+3}{y^3-3y^2+9y}$ (5 pts)

(c) $\dfrac{1-(1-x)^{-1}}{x^{-1}+(1-x)^{-1}}$ (4 pts)

6. Find the Least Common Denominator (LCD) of the following expression (**Do not simplify**)

$$\frac{x+y}{x^2+2xy-3y^2}-\frac{2y}{x^2+xy-6y^2}+\frac{5}{3(x-y)}$$ (5 pts)

7. Factorize the following as completely as possible:

(a) $x^{4n}-1$ (4 pts)

(b) $5xy+20y-15x-60$ (4 pts)

8. Write the complex number $\frac{4+i}{3+i}-\frac{1}{3-i}$ in the standard form. (5 pts)

9. (a) Solve for x in the equation $z=y(1+\frac{m}{x})$. (4 pts)

(b) Solve the quadratic equation $9x^2-12x-1=0$ by completing the square method. (4 pts)

10. Find a positive real number that is 5 larger than its **reciprocal**. (5 pts)

11. If -4 is a solution for the equation $kx^2+10x-8=0$.
(a) Find k (4 pts)

(b) Using the value of k in (a), find the other solution of the equation. (3 pts)

12. Find the solution set of $\frac{8}{2m+1}-\frac{1}{m-2}=\frac{5}{2m+1}$ (5 pts)