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

Code 003	**Math 001, Exam I** **Term (001)** **Sunday, October 8, 2000** **6:30 - 8:00 p.m.**

Code 003

STUDENT NAME:_____

ID #:_____ SECTION #:_____

Important Instructions

Use only 6 Digits I.D. # : i.e. Remove two zeros from 2000 of your ID#
(Example: ID# 20006587 should be bubbled as 206587)

> **Do not put any mark on a choice of any answer on the Exam Paper**

1. All types of Calculators, Pagers or Telephones are not allowed during the examination.

2. Use an HB 2.5 pencil. Any mistake in bubbling your ID number will cost you one grade point.

3. Use a good eraser. Do not use the eraser attached to the pencil.

4. Write your name, ID number and Mathematics Section number on the examination paper and in the upper left corner of the answer sheet.

5. When bubbling your ID number and Math Section number, be sure that bubbles match with the number that you write.

6. The test Code Number is already typed and bubbled in your answer sheet. Make sure that it is the same as that printed on your question paper.

7. When erasing a bubble, make sure that you do not leave any trace of pencilling.

8. Check that the exam paper has **18** questions.

1. One factor of $y^4 + 64$ is:

$x^4 \cdots$

(a) $y^2 + 4y - 8$

(b) $y^2 + 4y + 8$

(c) $y^2 - 4y - 8$

(d) $y^2 + 8$

(e) $y^2 - 8$

2. The expression $\left(\dfrac{(x-y)^2(2z^4)}{[z(x-y)]^3} \right)^2$ simplifies to:

(a) $\dfrac{2z^2}{(x-y)^2}$

(b) $\dfrac{4}{z^2(x-y)^2}$

(c) $\dfrac{1}{4z^2(x-y)^2}$

(d) $\dfrac{4z^2}{(x-y)^2}$

(e) $4z^3(x-y)$

3. If $a < -3$ then $|-5 - 2a|$ is equal to:

(a) $-5 - 2a$

(b) $5 + 2a$

(c) $5 - 2a$

(d) $2a - 5$

(e) 1

4. Sami spent 45732 Riyals in January, 4058 Riyals in February, 12310 Riyals in March and 1600 Riyals in April. The amount spent by Sami in the first three months is given by (in scientific notation)

(a) 62.1×10^4

(b) 6.21×10^4

(c) 6.32×10^4

(d) 6.37×10^4

(e) 63.7×10^3

5. The side length of a cube is given by 3 cm. If we _double_ the side length then the _volume of the new cube_ will be: (Hint: $V = L^3$).

   (a) 18 cm^3

   (b) 54 cm^3

   (c) 216 cm^3

   (d) 3916 cm^3

   (e) 729 cm^3

6. The conjugate of $z = (6 - 3i)(3 + i)^2$ is equal to:

   (a) $66 + 12i$

   (b) $-66 - 12i$

   (c) $-66 + 12i$

   (d) $12 - 25i$

   (e) $66 - 12i$

7. If $x < y$ then the expression $\left[(x^2 - 2xy + y^2)\right]^{1/2} + \left[(x - y)^3\right]^{1/3}$ simplifies to:

   (a) $2x$

   (b) 0

   (c) $2x - 2y$

   (d) $2y$

   (e) $-2x$

8. The expression $2[3(4a - b) - 2(5a - 3b)] - \{5[3a - (b - 4a)] + b\}$ simplifies to:

   (a) $12b - 9a$

   (b) $9a$

   (c) $10b - 31a$

   (d) $2b - 31a$

   (e) $2b + 9a$

9. The coefficient of $x^2 y$ in the product $(2x - y)^2 \left(x - y + \dfrac{3x}{y} \right)$ is:

(a) -8

(b) -5

(c) -11

(d) 3

(e) -3

$$= \left(4x^2 - 4xy + y^2 \right)\left(\dfrac{(x-y) - y^2 + 3x}{y} \right)$$

$$\left(x - y + \dfrac{3x}{y} \right)$$

$$\text{©} \quad -4x^2y - 4x^2 y$$

10. If $A + Bi = \dfrac{\sqrt[3]{-125} + i^{11} - \sqrt{-4}\sqrt{-1}}{i - 6}$ where $i = \sqrt{-1}$, then A and B are:

(a) $A = 17/37, \quad B = -9/37$

(b) $A = -17/37, \quad B = -9/37$

(c) $A = -5/35, \quad B = 9/35$

(d) $A = 5/37, \quad B = -9/37$

(e) $A = 17/37, \quad B = 9/37$

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11. The expression $\dfrac{3}{2-3\sqrt{2}} \cdot \dfrac{\sqrt{2}-1}{\sqrt{2}}$ is equal to:

(a) $\dfrac{3(1-2\sqrt{2})}{14}$

(b) $\dfrac{-3(1-2\sqrt{2})}{7}$

(c) $\dfrac{3(1+2\sqrt{2})}{14}$

(d) $3\sqrt{2}-3$

(e) $\dfrac{-(1-2\sqrt{2})}{3}$

12. If $x \neq 0$, $y \neq 0$ and $x \neq y$ then $\dfrac{x+y}{x-y} \cdot \dfrac{x^{-1}-y^{-1}}{x^{-1}+y^{-1}}$ simplifies to:

(a) 1

(b) $2x$

(c) $2y$

(d) -1

(e) 2

13. Only one of the following is <u>TRUE</u> for any real numbers a and b:

    (a) $\sqrt[3]{a^3 - b^3} = a - b$

    (b) $\sqrt{a + b} = \sqrt{a} + \sqrt{b}$

    (c) $\sqrt[6]{a^{12}b^6} = a^2|b|$

    (d) $(a^{-1} + b^{-1})^{-1} = a + b$

    (e) $\sqrt[4]{a^{16}b^4} = a^4 b$

14. One factor of $2 + 4x - 10x^4 - 5x^3$ is equal to:

    (a) $2 - 5x^3$

    (b) $2 + 5x^3$

    (c) $1 - 2x$

    (d) $2 + x$

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

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15. The expression $\dfrac{2}{\sqrt[3]{54}} + \dfrac{4}{\sqrt[3]{16}} - \dfrac{1}{\sqrt[3]{2}}$ is equal to:

(a) $5\sqrt[3]{2}$

(b) $\sqrt[3]{2}$

(c) $\dfrac{5}{6}\sqrt[3]{4}$

(d) $\sqrt[3]{4}$

(e) $\dfrac{\sqrt[3]{2}}{6}$

16. The expression $\dfrac{8 \div (2)(4) + (10)(\sqrt{1.44})}{(-32)^{3/5}} =$

(a) $-\dfrac{13}{8}$

(b) $\dfrac{7}{2}$

(c) $\dfrac{13}{8}$

(d) $-\dfrac{7}{2}$

(e) -14

17. The expression $\sqrt[3]{\sqrt{64}} - \sqrt[5]{.00032}$ is equal to:

(a) 7.8

(b) 1.8

(c) 6.4

(d) 1.98

(e) 1.9998

18. The expression $\dfrac{p+2}{3p^2+4p-4} + \dfrac{2p-1}{3p^2-5p+2} =$

(a) $\dfrac{p}{3p-2}$

(b) $\dfrac{3p+1}{3p-2}$

(c) $\dfrac{2p-1}{3p-2}$

(d) $\dfrac{p+1}{p-2}$

(e) $\dfrac{1}{p-1}$