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

Code 003

Math 001, Exam II
Term (001)
Sunday, November 12, 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. If $f(x) = 3x^2 - 1$, then $\dfrac{f(x+h) - f(x)}{h}$ is equal to:

(a) $6x$

(b) $6x + 3h^2$

(c) $6x + 3h$

(d) 6

(e) h

2. If $f(x) = \sqrt{x+4}$ and $g(x) = \sqrt{9 - x^2}$, then the domain of $\left(\dfrac{f}{g}\right)(x)$ is:

(a) $(-3, 3)$

(b) $[-4, \infty)$

(c) $[-4, 3)$

(d) $[3, \infty)$

(e) $[-3, 3]$

3. The x-intercepts of $f(x) = \left[-3x + \frac{3}{2}\right]$, where $[x]$ denotes the greatest integer function, are:

(a) $\left\{0, \frac{1}{2}\right\}$

(b) $[0, 1]$

(c) $\left[-\frac{1}{3}, 0\right]$

(d) $\left[0, \frac{1}{3}\right]$

(e) $\left(\frac{1}{6}, \frac{1}{2}\right]$

4. If the sum of the squares of three consecutive positive integers a, b and c is 149 then $a + b + c$ is equal to:

(a) 24

(b) 30

(c) -21

(d) 21

(e) 15

5. If the quadratic equation $x^2 - kx + 1 = -x$ has two distinct real roots, then K belongs to:

(a) $[-1, 3]$

(b) $(-\infty, -1) \cup (3, \infty)$

(c) $(-\infty, -3) \cup (1, \infty)$

(d) $(3, \infty)$

(e) $(-3, 1)$

6. The solution set of the equation $(x-3)^{1/2} - 5(x-3)^{1/4} + 6 = 0$ is:

(a) $\{-2, -3\}$

(b) ϕ

(c) $\{16, 81\}$

(d) $\{19, 84\}$

(e) $\{4, 9\}$

7. If $f(x) = x^2 + 1$, and $g(x) = -3$, then the value of $(f \circ g)(a) + 5$ is:

(a) -3

(b) $a^2 + 3$

(c) $a^2 - 3$

(d) 9

(e) 15

8. The solution set of $2x^2 - x = -4$ is

(a) $\left\{\frac{1}{4} \pm \frac{\sqrt{31}}{4}i\right\}$

(b) $\left\{\frac{1}{4} + \frac{\sqrt{31}}{4}i\right\}$

(c) $\left\{\frac{1}{4} - \frac{\sqrt{31}}{4}i\right\}$

(d) $\left\{-\frac{1}{4} \pm \frac{\sqrt{31}}{4}i\right\}$

(e) $\left\{\frac{1}{4} \pm \frac{\sqrt{31}}{4}\right\}$

9. If A is the solution set of $|2x-1| \leq 5$, and B is the solution set of $|x+1| > 2$ then $A \cap B$ is:

(a) $(-\infty, -3) \cup [-2, \infty)$

(b) $(1, 3]$

(c) $[-2, 1)$

(d) $(-3, -2] \cup [1, 3]$

(e) $(-3, 1)$

10. The solution set in interval notation, for $\frac{5}{2w+3} \geq \frac{-5}{w}$ is:

(a) $\left[-\frac{3}{2}, 0\right] \cup [0, 1]$

(b) $\left(-\frac{3}{2}, 0\right)$

(c) $\left[-\frac{3}{2}, -1\right]$

(d) $\left(-\frac{3}{2}, -1\right] \cup (0, \infty)$

(e) $\left(-\infty, -\frac{3}{2}\right) \cup [-1, 0)$

11. If the points $(K, -8), (-1, 7)$, and $(2, -2)$ lie on the same straight line, then K is equal to:

(a) -6

(b) -4

(c) 4

(d) 6

(e) $-\frac{3}{2}$

12. If $(1, 5)$ is the midpoint of a line segment with one endpoint $(2, 8)$, the other endpoint is:

(a) $(-1, -3)$

(b) $(4, 18)$

(c) $(-5, 21)$

(d) $(0, 2)$

(e) $(5, 21)$

13. The solution set, in interval notation, for $m - 6m^2 > -35$ is:

(a) $\left(-\frac{7}{3}, \frac{5}{2}\right)$

(b) $\left(\frac{5}{2}, \infty\right)$

(c) $(-\infty, \infty)$

(d) $\left(-\infty, -\frac{7}{3}\right) \cup \left(\frac{5}{2}, \infty\right)$

(e) $\left(\infty, -\frac{7}{3}\right)$

14. The solution set of $\frac{2(x-1)}{3} - \frac{5-x}{x+3} = \frac{2(x-1)}{x+3}$ is

(a) $\left\{\frac{5}{2}, -3\right\}$

(b) $\left\{\frac{3}{2}\right\}$

(c) $\left\{\frac{5}{2}\right\}$

(d) $\left\{\frac{5}{2}, \frac{3}{2}\right\}$

(e) ϕ

15. The solution set of the compound inequality

$$\frac{7x+6}{6} > \frac{x+2}{2} \text{ or } 4(x+4) > 2(2-x),$$

in interval notation, is equal to

(a) $(2, \infty)$

(b) $(-2, 0)$

(c) $(-\infty, 0)$

(d) $(-\infty, -2)$

(e) $(-2, \infty)$

16. The solution set of $\sqrt{8x+1} - 4 = 1 - 2x$ consists of:

(a) two positive integers

(b) one negative integer

(c) two integers, one negative and one positive

(d) no real solution

(e) one positive integer

17. The cost of producing x-calculators in dollars is given by $C = 1500 - \frac{3}{2}x$. The number of calculators that can be produced at cost of \$1200 equals to:

(a) 200

(b) 300

(c) 100

(d) 150

(e) 250

18. The solution set of $|x| + 3x - 9 = 0$ consists of:

(a) two positive rational numbers

(b) only one positive rational number

(c) one positive and one negative rational numbers

(d) two negative rational numbers

(e) only one negative rational number