

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 $\frac{f(x+h) - f(x)}{h}$ 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 $\left(\frac{f}{g}\right)(x)$ 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