

MAC 1140 TEST IIB
SPRING 2007

- A. Sign your scantron sheet in the white area on the back in ink.
- B. Write and code in the spaces indicated:
- 1) Name (last name, first initial, middle initial)
 - 2) UF ID number
 - 3) Discussion section number
- C. Under "special codes", code in the test ID number 2, 2.
- | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | • | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | • | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
- D. At the top right of your answer sheet, for "Test Form Code" encode B.
- | | | | | |
|---|---|---|---|---|
| A | • | C | D | E |
|---|---|---|---|---|
- E. While taking the test, please **keep your answer sheet covered** or **turned over at all times**.
- F. This test consists of 9 two-point, 3 three-point, and 7 four-point questions, and two sheets (4 pages) of partial credit questions worth 25 points. The time allowed is 90 minutes.
- G. **WHEN YOU ARE FINISHED:**
- 1) Before turning in your test check for transcribing errors. Any mistakes you leave in are there to stay.
 - 2) You must turn in your scantron to your discussion leader. Be prepared to show your picture I.D. with a legible signature.
 - 3) The answers will be posted on the MAC 1140 homepage after the exam.

Complete the following:

6. Solve the inequality: $\frac{1}{2x-6} < 0$.

Express your answer in interval notation.

- a. $(-3, \infty)$ b. $(3, \infty)$ c. $(-3, 3)$ d. $(-\infty, 3)$
-

7. $(\sqrt{6} + 2i)^2 =$ _____.

- a. $2 + 4i\sqrt{6}$ b. 10 c. $10 + 2i\sqrt{6}$ d. 2
-

8. The graph of an equation is symmetric with respect to the x -axis. If the graph contains the point $(4, -5)$, then which of the following points must also be on the graph?

- a. $(-5, 4)$ b. $(4, 5)$ c. $(-4, -5)$ d. $(-4, 5)$
-

9. Find the number and type of solutions to the equation $x^2 = 2x - 3$.

- a. Two complex, nonreal number solutions
b. Two irrational number solutions
c. Exactly one real number solution
d. Two rational number solutions

Part II: three points each

10. When finding the solution set of the equation $(x - 2)^{\frac{1}{2}} = 2x^{\frac{1}{4}}$, which of the following equations must be solved?

a. $x^2 - 20x + 4 = 0$

b. $x^2 - 2x + 4 = 0$

c. $x^2 + 4 = 0$

d. $x^2 - 6x + 4 = 0$

e. $x^2 - 20x + 4 = 0$

11. Home Depot sells top soil in 20 pound bags. However, the actual weight, x , of a bag may vary from 20 pounds by as much as 0.25 pound. Express this as an absolute value inequality and solve for x to find the acceptable range of actual weight (in pounds) of a bag of top soil.

a. $|x - 20| \leq 0.25$; (19.25, 20.75)

b. $|x - 0.25| \leq 20$; (19.75, 20.25)

c. $|x - 20| \leq 0.25$; (19.75, 20.25)

d. $|x - 0.25| \leq 20$; (19.25, 20.75)

e. $|x + 20| \leq 0.25$; (19.75, 20.25)

12. Find all values of a so that the point $(2, a)$ lies on the graph of $3x - y^2 = 1$.

a. $a = 5$ only

b. $a = \sqrt{5}$ only

c. $a = -\sqrt{7}$, $a = \sqrt{7}$

d. $a = -5$, $a = 5$

e. $a = -\sqrt{5}$, $a = \sqrt{5}$

Part III: four points each

13. Solve for x : $|4 - 3x| \geq 5$.

Express your answer in interval notation.

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

b. $\left[-\frac{1}{3}, 3\right]$

c. $\left[-3, \frac{1}{3}\right]$

d. $(-\infty, -\frac{1}{3}] \cup [3, \infty)$

e. $\left[-\frac{1}{3}, \infty\right)$

14. Use the quadratic formula to find the solution set of the equation $9x^2 + 1 = 2x$.

a. $\left\{\frac{1 \pm 2i\sqrt{2}}{9}\right\}$

b. $\left\{\frac{1 \pm \sqrt{10}}{18}\right\}$

c. $\left\{\frac{1 \pm 4i\sqrt{2}}{9}\right\}$

d. $\left\{\frac{1 \pm i\sqrt{71}}{2}\right\}$

e. $\left\{\frac{1 \pm \sqrt{10}}{9}\right\}$

15. Which of the following has solution set $(-\infty, \infty)$?

A. $|3x + 1| > -3$

B. $5x + 4 \geq 2x + 4$

C. the domain of the expression $\sqrt{x^2 + 3}$

a. C only

b. A only

c. B and C only

d. A and C only

e. A, B and C

16. In a small city, Comcast Cable charges \$55 per month for digital cable plus \$4 for each pay-per-view movie watched. For its customers who watched pay-per-view movies, the December bills before taxes ranged from \$71 to \$103. How many pay-per-view movies were watched by these customers in December?

- a. 4 to 12 inclusive
- b. 4 to 8 inclusive
- c. 5 to 8 inclusive
- d. 10 to 12 inclusive
- e. 5 to 10 inclusive

17. Find the solution set of the equation $x^{\frac{4}{3}} - 10x^{\frac{2}{3}} + 9 = 0$.

- a. $\{-3, -1, 1, 3\}$
- b. $\{1, 8\}$
- c. $\{-27, -1, 1, 27\}$
- d. $\{-8, -1, 1, 8\}$
- e. $\{1, 27\}$

18. A chemist has 3 gallons of a 10% boric acid solution. How many gallons of a 20% boric acid solution must she add to make a solution that is 16% boric acid? Use the table below to set up the problem.

	gallons	Concentration (%)	amount of acid

- a. 4 gallons
- b. 6 gallons
- c. 2.4 gallons
- d. 3.6 gallons
- e. 4.5 gallons

19. Find the distance between the origin and the midpoint of the segment whose endpoints are $(-1, 2)$ and $(5, 6)$.

a. $\sqrt{6}$

b. $2\sqrt{5}$

c. 10

d. $2\sqrt{3}$

e. $\sqrt{13}$

Bonus! (3 points) 20. Find all solutions of the equation $x^3 + 4x - 4x^2 - 16 = 0$ in the complex number system.

a. $\{-4, 2i\}$

b. $\{4, -2i, 2i\}$

c. $\{4\}$

d. $\{4, -2, 2\}$

e. The equation has no solution.

MAC 1140 Test IIB Part II
Spring 2007

Sect# _____ Name _____

UF ID _____ Signature _____

SHOW ALL WORK TO RECEIVE FULL CREDIT.

1. During Christmas break, a UF student drove his girlfriend home to meet his parents. They averaged only 40 mph from Gainesville to his home because of heavy traffic, but on the return trip to UF they were able to average 60 mph. If the total driving time was 15 hours, how long did it take the student to drive from Gainesville to his home? What is the distance between Gainesville and his home? Use the following table to set up the problem. You must solve using an equation.

	Rate (mph)	Time (hours)	Distance

Equation:

Time: _____ hours

Distance: _____ miles

2. Find the solution set of the following equation. Be sure to check your answers.

$$\sqrt{3x + 1} - \sqrt{x + 4} = 1$$

Solution Set: _____

3. Perform the operation and write your answer in standard form:

$$\frac{1 + 3i}{4 - 2i}$$

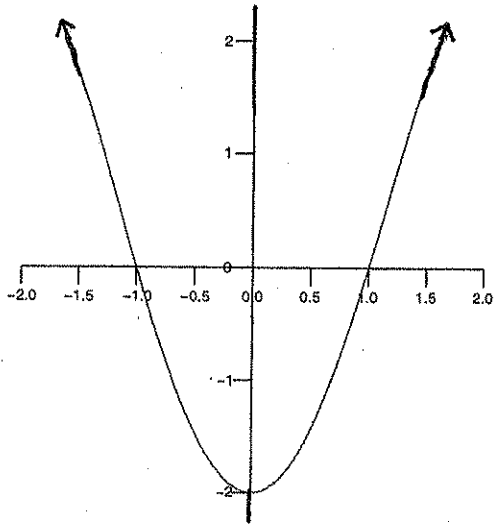
Name _____ Section _____

4. Find all real number solutions to the equation $|x^2 - 4x + 3| = 1$

$x =$ _____

5. Find each x and y -intercept of the graph of the equation $y = \frac{x - 4}{x^2 + 3}$.
Express your answers as ordered pairs.

6. Consider the graph below:



Complete the following:

a) Find each y -intercept of the graph of the equation.

$$y = \underline{\hspace{2cm}}$$

b) Find each x -intercept of the graph of the equation.

$$x = \underline{\hspace{2cm}}$$

c) Find all values of x so that the ordered pair $(x, 2)$ lies on the graph.

$$x = \underline{\hspace{2cm}}$$

d) Use interval notation to find all values of x for which $y < 0$. _____

e) Find any symmetries of the graph of the equation
(x -axis, y -axis or origin). If none, write "none".

Symmetric with respect

to _____