MAC 1140
Fall 2015
EXAM 1

Section # _____ Name _____

UF ID # _____ Signature _____

A. Sign your scantron on the back at the bottom in ink.

B. In pencil, write and encode on your scantron in the spaces indicated:

1) Name (last name, first initial, middle initial)
2) UF ID Number
3) Section Number

C. Under "special codes", code in the test ID number 1, 4.

● 2 3 4 5 6 7 8 9 0

1 2 3 ● 5 6 7 8 9 0

D. At the top right of your answer sheet, for "Test Form Code", encode D.

A B C ● E

E. 1) There are 5 (1-point) True/False questions, 10 (3-point) multiple choice questions, plus 4 (5-point) free response questions for a total of 55 points (this includes 5-points extra/bonus for this exam).
2) The time allowed is 90 minutes.
3) You may write on the test.
4) Raise your hand if you need more scratch paper or if you have a problem with your test. DO NOT LEAVE YOUR SEAT UNLESS YOU ARE FINISHED WITH THE TEST.

F. **KEEP YOUR SCANTRON COVERED AT ALL TIMES.**

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) Bring your test, scratch paper, and scantron to your proctor to turn them in. Be prepared to show your UF ID card.
3) Answers will be posted in Canvas after the exam.

The Honor Pledge: "On my honor, I have neither given nor received unauthorized aid in doing this exam."

Student's Signature:_____

Questions 1–5 are worth 1 point each.

1. If x and y are positive, $|6\,x - 12\,xy| = -6\,x|2\,y - 1|$.

   A. True B. False

---

2. A real number is either a rational or an irrational number.

   A. True B. False

---

3. The domain of the expression $\dfrac{\sqrt{x^2}}{x}$ is all the real numbers.

   A. True B. False

---

4. The expression $-12\,x^9 + 6\,x^8 + x^5 + \dfrac{1}{x}$ is a polynomial.

   A. True B. False

---

5. If $|\sqrt{x}| = 5$ then x must be 25.

   A. True B. False

Questions 6–15 are worth 3 point each.

6. Find the sum of the solutions to the equation $x^2 - 6\,x - 6 = 0$

   A. 3 B. 4 C. 5 D. 6 E. 7

---

7. Simplify the difference quotient by rationalizing the numerator.

$$\frac{\sqrt{x+h}-\sqrt{x}}{h}$$

A. $\dfrac{2x^2+h^2}{h(\sqrt{x+h}-\sqrt{x})}$

B. $\dfrac{2x+h}{h(\sqrt{x+h}+\sqrt{x})}$

C. $\dfrac{h}{(\sqrt{x+h}-\sqrt{x})}$

D. $\dfrac{\sqrt{h}}{h}$

E. $\dfrac{1}{\sqrt{x+h}+\sqrt{x}}$

---

8. Which of the following are true?

a. $\sqrt{2\,x^2}+\sqrt{200\,x^2}=11|x|\sqrt{2}$

b. $\sqrt[3]{(-5)^6}=\sqrt[3]{-5^6}$

c. $\sqrt[7]{-5^3}$ is undefined.

A. b and c only B. a only C. a and c only

D. b only E. a, b and c

---

9. Find the interval which has the solution(s) to the equation.

$$\frac{3}{x-2}=\frac{1}{x-1}+\frac{7}{x^2-3x+2}$$

A. $[0,1)$ B. $[3,4)$ C. $[4,5)$

D. $[1,2)$ E. $[2,3)$

---

10. Find the sum of the solutions to the following equation.

$$x^2 + 1 = |2\,x|$$

A. 0 B. 1 C. 2 D. 3 E. 4

---

11. Simplify the following exponents. Do not leave negative exponents in your final answer.

$$\left(\frac{x^{-1}y^{-4}z^2}{x^1y^1}\right)^{-1}$$

A. $\dfrac{x^2z^2}{y^5}$ B. $\dfrac{z^2}{x^2y^5}$ C. $\dfrac{x^2y^5}{z^2}$

D. $\dfrac{y^5}{x^2z^2}$ E. $\dfrac{y^3}{z^2}$

---

12. Factor the following: $27\,x^3 + 1$

A. $(9\,x^2 - 3\,x + 1)(3\,x + 1)$

B. $(3\,x + 1)(3\,x - 1)$

C. $(3\,x + 1)^3$

D. $(9\,x^2 + 3\,x + 1)(3\,x - 1)$

E. None of the others.

---

13. Find the domain of the function $f(x) = \dfrac{1}{x^2 - 8\,x + 15}$

A. $x \neq 3$

B. $x \neq 5$ and $x \neq 3$

C. $x \neq 5$

D. $x = 5$ and $x = 3$

E. None of the others.

---

14. Divide the rational expression and simplify the result:

$$\frac{x^2 - x - 6}{x^2 + 2x + 1} \div \frac{x - 3}{-2x - 2}$$

A. $-\dfrac{(x+2)(x-3)^2}{2(x+1)^3}$

B. None of the others.

C. $-\dfrac{2(x+2)}{x+1}$

D. $-2(x+2)(x+1)$

E. $-\dfrac{2(x+1)}{x+2}$

---

15. Find the domain of $f(x) = \dfrac{\sqrt{7-x}}{x^2 - 49}$.

A. $(-\infty, 7) \cup (7, \infty)$

B. $(-\infty, -7) \cup (-7, 7)$

C. $(-\infty, -7) \cup (-7, 7) \cup (7, \infty)$

D. $(-\infty, -7) \cup (-7, \infty)$

E. None of the others.

Section # _____ Name _____

UF ID # _____ Signature _____

YOU MUST SHOW ALL WORK TO RECEIVE FULL CREDIT.

Free response questions 1–4 are worth 5 points each.
You must show complete algebraic work to receive credits!

1. [5 Points] Solve $9(x+1)^2 + 6(x+1) + 1 = 0$.

2. [5 Points] Solve $x^3 - 3\,x^2 - 5\,x + 15 = 0$

3. [5 Points] Solve $(5\,x+2)^{-1/2}+2\,(5\,x+2)^{1/2}=0$.

4. [5 Points] Solve: $4\,x^2+20\,x-25=0$. (Hint: Complete the square)