MAC 1147
Fall 2019
EXAM 1A

A. Sign and date your scantron on the back at the bottom.

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

1) Name (last name, first initial, middle initial)
2) UF ID Number
3) Section Number — Do not fill this out.

C. Under "special codes" on your scantron, code in the test ID number 1, 1.

● 2 3 4 5 6 7 8 9 0
● 2 3 4 5 6 7 8 9 0

D. At the top right of your scantron, for "Test Form Code", encode A.

● B C D E

E. 1) There are eighteen 4-point multiple-choice questions and two 4-point free response questions, for a total of 80 points.
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) Take your test, scratch paper, and scantron to your TA. Be prepared to show your UF ID card.
3) Answers will be posted in E-Learning after the exam.

H. By taking this exam, you agree to the following **Honor Pledge:**

"I will neither give nor receive any unauthorized aid for this exam."

Questions 1–20 are worth 4 points each.

1. Evaluate. $\sqrt{9}$

A. -3 B. ± 3 C. 3 D. 9 E. ± 9

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2. Which of these is **not** a factor of the expression $4x^4 + 7x^3 - 15x^2$?

A. $2x + 1$

B. x^2

C. $x + 3$

D. $4x - 5$

E. All of these are factors of the expression

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3. To solve the equation $x^2 - 10x = 13$ using the method of completing the square, you would _____ both sides of the equation.

A. subtract 10 from B. add 10 to C. subtract 25 from

D. add 25 to E. subtract 13 from

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4. Suppose that k is a real number. Which description represents all values of x for which the equality $\dfrac{|x-k|}{x-k} = -1$ is true?

A. $x > k$ B. $x \geq k$ C. $x < k$ D. $x \leq k$ E. $x \neq k$

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5. Which value is **not** in the domain of the expression $\dfrac{x-7}{\sqrt{(x-2)^2-2}}$?

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

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6. Which of these describes all restrictions on the domain of the expression $\dfrac{x-1}{x-3} \div \dfrac{x-2}{x-4}$?
All real numbers except...

A. $x \neq 4$ B. $x \neq 3, 4$ C. $x \neq 2, 3, 4$

D. $x \neq 1, 2, 3, 4$ E. $x \neq 0, 1, 2, 3, 4$

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7. Choose the set that represents the solution to the inequality $|x+7| > 15$.

A. $(8, \infty)$ B. $[-\infty, -8) \cup (8, \infty)$ C. $(-22, 8)$

D. $(-\infty, -22) \cup (8, \infty)$ E. $(-\infty, 8)$

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8. The endpoints of a diameter of a circle are located at the points $(-4, 2)$ and $(12, -10)$. Find the standard form of the equation of the circle.

A. $(x+4)^2 + (y-4)^2 = 20^2$

B. $(x-4)^2 + (y+2)^2 = 10^2$

C. $(x-4)^2 + (y+4)^2 = 20^2$

D. $(x-4)^2 + (y+2)^2 = 20^2$

E. $(x-4)^2 + (y+4)^2 = 10^2$

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9. If the line L_1 is parallel to $2x - 5y = 3$, then the slope of line L_1 is...

A. 3 B. -5 C. $-\frac{5}{2}$ D. $\frac{2}{5}$ E. -3

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10. Multiply and choose the correct result: $(x^2 - 5x + 2)(x^2 + 3)$

A. $x^4 - 5x^3 + 5x^2 - 15x + 6$

B. $x^4 + 5x^3 - 5x^2 - 15x + 6$

C. $x^4 - 5x^3 + 5x^2 + 15x - 6$

D. $x^4 + 5x^3 + 5x^2 + 15x - 6$

E. $x^4 + 5x^3 + 5x^2 + 15x + 6$

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11. Perform the subtraction and simplify:

$$\frac{6}{(x+1)^2(x-5)} - \frac{5}{(x+1)(x-5)^2}$$

A. $\frac{11x - 25}{(x+1)^2(x-5)^2}$ B. $\frac{x - 25}{(x+1)^2(x-5)^2}$ C. $\frac{11x - 35}{(x+1)^2(x-5)^2}$

D. $\frac{x - 35}{(x+1)^2(x-5)^2}$ E. $\frac{1}{(x+1)^2(x-5)^2}$

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16. In which categories does the number .656565... fit?

P. Integers

Q. Rational Numbers

R. Irrational Numbers

S. Real Numbers

A. P only B. P and Q only C. Q only

D. Q and S only E. R and S only

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17. Factor completely and choose the equivalent expression: $27 - (3 - x)^3$

A. $x(x^2 - 9x + 27)$ B. $(6 - x)(x^2 - 9x + 9)$ C. $(6 - x)(x^2 - 3x + 9)$

D. $-x(x^2 - 9x + 27)$ E. $(x - 6)(x^2 - 3x + 9)$

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18. Suppose that $a > 1$, $b < -1$ and n is a positive integer. Choose the true statement.

A. $(a - b)^2 = a^2 - b^2$ B. $a^{-n} = -\dfrac{1}{a^n}$ C. $\dfrac{a + b}{a} = 1 + b$

D. $|b| = -b$ E. $\dfrac{1}{ab} = \dfrac{1}{a}b$

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12. Solve the equation $\sqrt{8-x} = 2x - 1$ by eliminating the radical. Which of the values below appears as an extraneous solution?

A. -2 B. -1 C. 0 D. 1 E. 2

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13. Identify the solution set of the inequality: $-5 < -3x + 4 \leq 31$

A. $(-3, 9]$ B. $(-9, 3]$ C. $[-9, 3)$ D. $[-3, 9)$ E. $[-3, 9]$

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14. A line segment has one endpoint at $(6, -4)$ and its midpoint at $(1, 3)$. Its other endpoint is at...

A. $(-5, 9)$ B. $(-3, 11)$ C. $(-4, 12)$ D. $(-3, 13)$ E. $(-4, 10)$

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15. A line passes through the points $(5, 8)$ and $(9, 14)$. Its y-intercept is the point...

A. $(\frac{1}{2}, 0)$ B. $(0, 0)$ C. $(0, 1)$ D. $(0, \frac{1}{2})$ E. $(1, 0)$

T.A. _____ Disc. Per. ____ Name _____

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

UF ID # _____ Signature _____

YOU MUST SHOW ALL WORK TO RECEIVE FULL CREDIT.

Free response questions 19–20 are worth 4 points each.

19. Simplify the given difference quotient and state any restrictions on its domain.

$$\frac{\dfrac{1}{2(x+h)} - \dfrac{1}{2x}}{h}$$

Answer: _____

TURN OVER FOR THE LAST PROBLEM.

20. Solve the equation for x. Simplify your solutions.

$$3x^4 = 6x^3 + 6x^2$$

All solutions _____

Turn in your scantron and your free response to your TA. The worked-out solutions will be posted on Canvas after the test.