This review, produced by the Broward Teaching Center, contains a collection of questions which are representative of the type you may encounter on the exam. Other resources made available by the Teaching Center include:

- Walk-In tutoring at Broward Hall
- Private-Appointment, one-on-one tutoring at Broward Hall
- Walk-In tutoring in LIT 215
- Supplemental Instruction
- Video resources for Math and Science classes at UF
- Written exam reviews and copies of previous exams

The teaching center is located in the basement of Broward Hall:

You can learn more about the services offered by the teaching center by visiting https://teachingcenter.ufl.edu/
MAC 1105 Final Exam Review

1. State the smallest set (natural, whole, integer, etc) the following real numbers belong to:

   A. $-\frac{21}{7}$
   B. $-\frac{0}{\pi}$
   C. $-\frac{\pi}{0}$
   D. $\sqrt{9}$
   E. $\sqrt{3}$
   F. $2.757575....$
   G. $\frac{17}{25}$

2. Identify the following complex numbers as pure imaginary or nonreal complex:

   a) $7 - i$
   b) $3 + 2i$
   c) $4 + 2i$
   d) $-2 - 3i$
   e) $7i$
   f) $-2i$
   g) $-5 + 4i$

3. Simplify the following expressions below:

   a) $11 - 8 \div 4 \ast 12 - (6 \ast 15)$
   b) $15 - 8 \div 2 \ast 7 - (18 \ast 1)$
   c) $14 - 12 \div 3 \ast 5 - (14 \ast 12)$

4. Simplify:

   a) $i^{40}$
   b) $i^{22}$
   c) $i^7$
   d) $i^{102}$
   e) $i^{57}$
   f) $i^{120}$

5. Simplify:

   a) $(4 + 7i) + (2 + 3i)$
   b) $(5 + 6i) + (7 - 3i)$
   c) $(4 + 7i) - (2 + 3i)$
   d) $(5 + 6i) - (7 - 3i)$

6. Simplify:

   a) $(−9i + 4)(−10i + 6)$
   b) $(−4i − 1)(−10i − 5)$
   c) $\frac{4i − 3}{−8i + 7}$
7. Factor the following completely:
   a) \( x^2 + 24x + 80 \)  
   b) \( x^2 + 44x + 480 \)  
   c) \( 64x^2 + 48x + 9 \)  
   d) \( 36x^2 - 64 \)  
   e) \( -160xy^4 - 40x \)  
   f) \( -64x^4y^4 + 192x^4 - 192x^2y \)

8. Solve the following equations:
   a) \( -15(4x - 2) = -11(7x - 6) \)  
   b) \( -9(-6x - 5) = -7(10x - 4) \)  
   c) \( -5[-3x - 3 - 6(x + 1)] = -5x + 2 \)  
   d) \( \frac{5x + 8}{6} - \frac{6x - 8}{4} = \frac{-4x - 6}{3} \)

9. Find the equation of the line containing the two points below. Write the equation as \( y = mx + b \).

   (8, 2) and (2, -5).

10. Solve the inequality:

\[ -7 - 11x - 3 \geq -12x - 4 \]

11. Solve the linear inequality below:

\[ -\frac{4x}{3} + 2 > \frac{5x}{7} - 1 \]

12. Solve the following quadratic equations:
   a) \( 9x^2 + 3x - 20 \)  
   b) \( -4x^2 + 4x + 4 \)  
   c) \( x^2 - 10x + 61 = 0 \)  
   d) \( x^2 + 3x - 9 = 0 \)

13. Solve the following equations:
   a) \( \sqrt{x + 7} + 5 = x \)
   b) \( \sqrt{x + 4} = x - 4 \)
14. Solve the radical equations below:
   a) \(-3x + 6 - \sqrt{5x + 4} = 0\)
   b) \(-3x + 9 - \sqrt{9x - 2} = 0\)

15. Determine the domain of the radical functions below:
   a) \(\sqrt{-7x + 8}\)
   b) \(\sqrt{3x + 4}\)

16. Find a polynomial of degree 3 with real coefficients:
    zeros: -2, 1, 0

17. Combine into a single logarithmic expression:
   a) \(\ln 3 + \frac{1}{2} \ln x + \ln y - \frac{1}{3} \ln z\)
   b) \(\log_3 2 + \log_3 (x + 1) - 2 \log_3 (1 + \sqrt{x})\)

18. Convert the following functions below from logarithmic to exponential or exponential to logarithmic in order to solve for \(x\):
   a) \(4^x = \frac{1}{16}\)
   b) \(\log_4 x = 3\)
   c) \(\log_5 x = 4\)
   d) \(6^x = \frac{1}{36}\)

19. Solve the radical equation below:
   \(\sqrt{-3x + 6} - \sqrt{5x + 4} = 0\)

20. Determine the domain of the radical functions below:
   a) \(\sqrt{-7x + 8}\)
   b) \(\sqrt{3x + 4}\)

21. Find a polynomial of degree 3 with real coefficients:
    zeros: -2, 1, 0

22. Combine into a single logarithmic expression:
   a) \(\ln 3 + \frac{1}{2} \ln x + \ln y - \frac{1}{3} \ln z\)
   b) \(\log_3 2 + \log_3 (x + 1) - 2 \log_3 (1 + \sqrt{x})\)