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/
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) \( 7 - i \)  
  e) \( 7i \)  
  b) \( 3 + 2i \)  
  f) \( -2i \)  
  c) \( 4 + 2i \)  
  g) \( -5 + 4i \)  
  d) \( -2 - 3i \)

3. Simplify the following expressions below:

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

4. Simplify:

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

5. Simplify:

a) \( (4 + 7i) + (2 + 3i) \)  
  c) \( (4 + 7i) - (2 + 3i) \)  
  b) \( (5 + 6i) + (7 - 3i) \)  
  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 rational equations below:
   a) \( \frac{1}{-63x - 81} - \frac{27}{-63x - 81} = -\frac{27}{-63x - 81} \)
   b) \( \frac{2x}{-3x - 6} + -\frac{5x^2}{-9x^2 - 9x + 18} = \frac{6}{3x - 3} \)

15. Solve the radical equation below:
   \( \sqrt{3x + 9} - \sqrt{9x - 2} = 0 \)

16. Find a polynomial of degree 3 with real coefficients that satisfies the given conditions:
   zeros: -2, 1, 0 \( p(2) = 16 \).

17. Solve the radical equation below:
   \( \sqrt{9x - 2} = 0 \)

18. Combine into a single logarithmic expression:
   a) \( \log_{5} x = 4 \)
   b) \( \log_{4} x = 3 \)
   c) \( \log_{5} x = 4 \)
   d) \( 6^x = \frac{1}{36} \)

20. Combine into a single logarithmic expression:
   a) \( \ln 3 + \frac{1}{2} \ln x + \ln y - \frac{1}{3} \ln z \)
   b) \( \log_{5} 2 + \log_{5}(x + 1) - 2 \log_{5}(1 + \sqrt{x}) \)