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. Answer the following true or false questions. If false, provide an example to show why it is false. Let a, b, and c be Real numbers.
   A. **Associative:** $(a + b) + c = a + (b + c)$
   B. **Distributive:** $a(b - c) = ab - ac$ for all Real numbers $a$, $b$, and $c$.
   C. **Inverse:** $a \cdot \frac{1}{a} = 1$ for all Real numbers $a$.
   D. **Commutative:** $a - b = b - a$

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. Sketch the following subsets of the real numbers on a number line
   (a) $[-4, 12)$
   (b) $(-\infty, 0]$  
   (c) $x - 3 \leq 5$  
   (d) $x$ is no larger than 9.

3. Sketch the following subsets of the real numbers on a number line
   (a) $|x| < 2$  
   (b) $|x| \geq 2$  
   (c) $|x - 1| > 3$  
   (d) The distance from $x$ to 1 is at least 2.

4. Simplify the radical expressions
   (a) $\frac{\sqrt{18x^5 \cdot x^7}}{\sqrt{2x^5}}$
   (b) $\sqrt{64x^{10} - 32x^5}$
   (c) $\frac{2 \cdot \sqrt{I^2 + I^2}}{2}$

5. Write each function piecewise without absolute value bars.
   (a) $e(x) = |x|$
   (b) $f(x) = |2x + 1|$

6. Expand each of the following expressions.
   (a) $(x + 1)^2$
   (b) $(x - 2)(x + 2)$
7. Factor each of the following polynomials.

(a) \(8y^2(x + 3) - 2(x + 3)\)
(b) \(x^4 - 4\)
(c) \(x^2 + x - 6\)
(d) \(3x^2 - 6x + 3\)
(e) \(2x^2 + 5x - 3\)
(f) \(x^3 - 27\)
(g) \(x^3 + 3x^2 - 6x - 18\)

8. Find and simplify the difference quotient \(\frac{f(x + h) - f(x)}{h}\) for the function:

(a) \(f(x) = x^2 + x\).
(b) \(f(x) = x^2 - 2x\)

9. Simplify each expression, leaving positive exponents only.

(a) \(3x^{-4/3} + 2x^{-1/3}\)
(b) \(-x^{-1}(1 + x^2)^{-2/3} - 2x^{-3}(1 + x^2)^{1/3}\)
(c) \(x^2(1 - 2x)^{-3/2} + (1 - 2x)^{-1/2}\)

10. Find the domain of each of the following functions.

(a) \(f(x) = \frac{1}{\sqrt{x^2 - 1}}\)
(b) \(g(x) = \frac{x - 3}{x^2 - 5x + 10}\)
(c) \(h(x) = \sqrt{2x + 7}\)

11. Solve the following equations for the indicated variable.

(a) \(y = \frac{x + 2}{x - 1}\) for \(x\).
(b) \(4x^2 - 1 = 7\) for \(x\)
(c) \(\sqrt{3 - 2t} = t\) for \(t\)
12. Solve the following inequalities.
   (a) \(-2x + 1 \geq 0\)
   (b) \(\frac{1}{x - 6} < 0\)
   (c) \(|x - 5| + 15 > 5\)

13. Determine the equation of a circle centered at \((1, 4)\) of radius 2.

14. Consider the points \(P = (1, 3)\) and \(Q = (4, 7)\).
   (a) Find the distance between \(P\) and \(Q\).
   (b) Find the midpoint of the line segment joining \(P\) and \(Q\).
   (c) Find the equation of the circle, centered at the midpoint between \(P\) and \(Q\), which passes through both \(P\) and \(Q\).

15. Sketch the graphs of the following relations.
   (a) \((x - 1)^2 + (y - 1)^2 = 2\)
   (b) \(y = 2x - 3\)

16. Consider the function \(f(x) = x^2 - 6x + 9\).
   (a) Find the \(y\)-intercept (if it exists) of \(f(x)\).
   (b) Find any \(x\)-intercepts (if they exist) of \(f(x)\).

17. Plot the points \(P = (2, 2)\) and \(Q = (-1, 3)\).
   (a) Find the equation for the line passing through \(P\) and \(Q\); graph this line.
   (b) Find the equation for the line passing through \(P\) which is perpendicular to the line from part (a); graph this line.

18. Graph the function \(f(x) = x^2\).
   (a) Find the slope of the line joining the points \((1, f(1))\) and \((4, f(4))\).
   (b) Find the slope of the line joining the points \((1, f(1))\) and \((2, f(2))\).