ARE YOU PREPARED?

✓ This mini quiz is meant to serve only as an indicator of a few of the math skills that you are expected to know at the beginning of this course. Do not use these problems as a study guide thinking that they will adequately prepare you for the course.

✓ These example problems are merely representative of some of the most important concepts that are taught in the prereq.

✓ The course will offer little or no time for any type of review; it assumes that you are prepared to do the work the first day of class. uisite courses.
Below are some of the major topics covered in MATH 241

You **MAY** use your calculator

1. Evaluating limits of functions
2. Continuity of functions
   - A. Continuity at a point
   - B. Intervals of continuity
   - C. Removable and essential discontinuities
   - D. Viewing practical situations in terms of a continuous function
3. Differentiation
   - A. Definition of a derivative function
   - B. Rules for finding the derivatives of algebraic, exponential, and logarithmic functions
   - C. Implicit differentiation
   - D. Logarithmic differentiation
   - E. Higher order derivatives
4. Applications of differentiation
   - A. Graphing
   - B. Extrema problems
   - C. Business applications
5. Integration
   - A. Definition of the definite integral and the indefinite integral
   - B. Techniques for evaluating the indefinite integral and the definite integral
   - C. Applications of integration in problems related to business
   - D. Approximate integration
   - E. Solving differential equations

To be successful studying the topics covered in this course, students should be appropriately prepared by: #1 Taking the prerequisite math course within the last three years with a passing grade of A or B, or within the last one year with a passing grade of C, or #2 placing into the course by the ASSET placement test.
Below is a sample of some skills you should have **BEFORE** entering MATH 241.

You **MAY** use a calculator

1. Solve for \( x \):
   \[
   \frac{x^2 + 3x}{x^2 + 2x - 8} \geq 0
   \]

2. Solve for \( x \):
   \[
   4 < \left| \frac{2}{3}x + 5 \right|
   \]

3. What is the domain, range, and graph of the function
   \[
   y = f(x) = \begin{cases} 
   1 - x, & \text{if } x < 0 \\
   1, & \text{if } x > 0 
   \end{cases}
   \]

4. Solve the system:
   \[
   \begin{cases}
   y = \frac{18}{x + 4} \\
   x - y + 7 = 0
   \end{cases}
   \]

5. Solve for \( x \):
   \[
   \log_x (2x + 3) = 2
   \]

6. Solve for \( x \):
   \[
   e^{\ln(x+4)} = 7
   \]

7. If $2600 is invested for 6.5 years at 6% interest compounded quarterly, find:
   a) The compounded amount  
   b) The compounded interest

8. If \( f(x) = 4x \) and \( g(x) = x^2 + 6x^{-1} \), find:
   a) \((f - g)\left(\frac{x}{2}\right)\)  
   b) \((fg)(-0.5)\)  
   c) \(f\left(g\left(\frac{1}{x}\right)\right)\)

9. Find the effective interest rate equivalent to an annual rate of 6 percent compounded continuously.

10. Give the domain, range, and sketch the graph of the function:
    \[
    y = f(x) = \sqrt{x - 2}
    \]
ANSWERS

1. \( x < -4 \text{ or } -3 \leq x \leq 0 \text{ or } x > 2 \)
   \((-\infty, -4) \cup [-3, 0] \cup (2, +\infty)\)

2. \[
\begin{cases}
  x < -\frac{27}{2} \text{ or } x > -\frac{3}{2} \\
  (-\infty, -\frac{27}{2}) \cup (-\frac{3}{2}, +\infty)
\end{cases}
\]

3. Domain: \((-\infty, 0) \cup (0, \infty)\)
   Range: \([1, \infty)\)

4. \(\{ (-1, 6), (-10, -3) \}\)

5. \(x = 3\)

6. \(x = 3\)

7. a) \$3829.04  b) \$1229.04

8. a) \(2x - \frac{x^2}{4} - \frac{12}{x}\)  b) 23.5  c) \(\frac{4}{x^2} + 24x\)

9. \(6.18\%\)

10. Domain: \([2, \infty)\)
    Range: \([0, \infty)\).

How many of these problems can you miss and still succeed in MATH 241?

Ideally, NONE.

These problems are just a sample of the larger number of skills that you should be familiar with BEFORE taking this course.

If some of these ideas are not familiar to you, you should consider enrolling in one of the prerequisite courses (MATH 111B or MATH 111C).