This test will assess your pre-calculus skills for placement into PRE-CALCULUS II (Math 138), and CALCULUS (Math 150). Eligibility for Math 138 will be based on scores achieved in competency areas 5, 6, and 8 on the 90-minute, 60-item Pre-Calculus Test. Eligibility for Math 150 will be based on scores achieved in all competency areas on the 90-minute, 60-item Pre-Calculus Test.

More extensive study packets are available at the Campus Bookstore.

PLEASE NOTE: CALCULATORS ARE NOT ALLOWED AT ASSESSMENT TESTING. IT IS BEST TO STUDY WITHOUT THE AID OF A CALCULATOR.

1. Elementary operations with numerical and algebraic fractions
   \[ \frac{3x - 2}{x + 2} - \frac{2}{x - 2} = \]
   (A) \( \frac{3}{x + 2} \)  (B) \( \frac{3x - 4}{x^2 - 4} \)  (C) \( \frac{3x}{x^2 - 4} \)  (D) \( \frac{x(3x - 10)}{x^2 - 4} \)  (E) \( \frac{3x(x - 4)}{x^2 - 4x + 4} \)

2. Operations with exponents and radicals
   \[ \frac{x^{3a+2}}{x^{2a-1}} = \]
   (A) \( x^{3a+3} \)  (B) \( x^{a-3} \)  (C) \( x^{5a-1} \)  (D) \( x^3 \)

3. Linear equations and inequalities
   For what value of \( t \) does \( \frac{2t - 1}{3t + 4} = 2 \)?
   (A) \(-6\)  (B) \(-\frac{9}{4}\)  (C) \(\frac{3}{2}\)  (D) \(\frac{9}{4}\)  (E) There is no value of \( t \) satisfying this equation.

4. Polynomials and polynomial equations
   If \((x - 1)(x^2 - 4) + 2(x - 1)(x + 2) = (x - 1)P\), then \( P = \)
   (A) \(x^2 - 2\)  (B) \(x^2\)  (C) \(x(x + 2)\)  (D) \(x^2 + 2\)  (E) \((x + 2)^2\)

5. Functions
   If \( f(x) = 2x + 5 \) and \( g(x) = 1 - x^2 \), then \( f(g(2)) = \)
   (A) \(-3\)  (B) \(-1\)  (C) \(1\)  (D) \(2\)  (E) \(9\)

6. Trigonometry
   If \( \sin \theta = \frac{3}{5} \) and \( 0 \leq \theta \leq \frac{\pi}{2} \), then \( \tan \theta = \)
   (A) \(\frac{3}{2}\)  (B) \(\frac{4}{3}\)  (C) \(\frac{5}{4}\)  (D) \(\frac{4}{5}\)  (E) \(\frac{3}{4}\)

7. Logarithmic and exponential functions
   \( \log_5 27 = \)
   (A) \(81\)  (B) \(9\)  (C) \(3\)  (D) \(\frac{1}{3}\)  (E) \(\frac{1}{9}\)

8. Mathematical modeling – word problems
   If \( \frac{2}{3} \) is \( \frac{1}{2} \) of \( \frac{4}{5} \) of a certain number, then that number is
   (A) \(\frac{15}{4}\)  (B) \(\frac{5}{3}\)  (C) \(\frac{5}{6}\)  (D) \(\frac{5}{12}\)  (E) \(\frac{4}{15}\)

ANSWERS: (1) D  (2) A  (3) B  (4) C  (5) B  (6) E  (7) C  (8) B