The Board of Higher Education has mandated that students entering the public colleges and UMass must take the Accuplacer Elementary Algebra Test. A total of 12 questions are divided into three types.

The first type involves operations with integers and rational numbers, the use of absolute value, and ordering.

Examples:

1. \( \frac{2}{8} x - \frac{1}{3} = \)
2. \( \frac{3}{4} + \frac{5}{6} = \)
3. \( |-5 + 2| \)
4. Which is the smallest: \( 1, -1, -\frac{1}{3}, \frac{1}{3}, -3? \)

The second type involves operations with algebraic expressions including adding, subtracting, multiplying and dividing monomials and polynomials, the evaluation of roots and exponents, simplifying algebraic fractions, and factoring.

Examples:

1. \( 3(2x - 1) - (3x - 1) = \)
2. \( \frac{2x}{3y} \left( \frac{5xy^2}{4xy^3} \right) = \)
3. \( \frac{4}{x - 4} - \frac{2}{x - 2} = \)
4. \( (3a - 2b)^2 = \)
5. \( (x^2 - y^2)^{-1} = \)
6. \( \frac{x^{-3}}{x^{-2}} = \)
7. \( (-4a)^2 = \)
8. \( \sqrt{25x^4y^8} = \)
9. Factor \( x^2 - 4y^2 \)
10. Factor \( 3x^2 - 5x - 2 \)

The third type of question involves the solution of equations, inequalities, and word problems. Questions from this category include solving linear equations and inequalities, the solution of quadratic equations by factoring, solving verbal problems presented in an algebraic context, including geometric reasoning and graphing, and the translation of written phrases into algebraic expressions.

Examples:

1. Solve \( x^2 - 2x - 8 = 0 \)
2. Solve \( \frac{x}{x - 4} = 2 \)
3. Solve and exhibit the solution on the number line: \( 2x - 1 < 3x + 2 \).
4. Find \( y \) if \( \begin{cases} 2x - y = 4 \\ 1 = -x - y \end{cases} \)
5. Shade the set of points that satisfy the pair of inequalities:
   \( \begin{cases} x + y \geq 0 \\ y \leq 0 \end{cases} \)
6. If a certain number is doubled and then 5 is subtracted, the result is 9. What is the number?
7. A car goes \( x \) mph. How far will it go in 75 minutes?