This sheet is to provide you with further information as you work toward achieving 90% proficiency on this gateway about algebraic expressions and equations. As you look through the key ideas below, try to create a realistic picture of what you understand and what you don’t — the first attempt at the gateway should help you with this. While preparing for the second attempt, if necessary, you should take full advantage of working with your peers, seeking help from other students, tutors in the tutoring lab, supplemental instruction coaches and your instructor. Calculators will not be allowed so do not use them when you are practicing these problems.

1. Convert a common fraction to a decimal fraction, to the nearest thousandth, and to a percent, to the nearest tenth of a percent. For example, \( \frac{1}{6} = 0.167 = 16.7\% \)

Ex. \( \frac{2}{7} \)

2. Simplify an algebraic expression using the distributive law and by combining like terms.

Ex. \( 3(2x - 7) - 4(2x + 5) \)

3. Evaluate an algebraic expression for given values of the variables.

Ex. \( -4x + 9y - 3x - y \) for \( x = -4 \) and \( y = 7 \)

4. Multiply two monomials using properties of exponents. Ex. \( (3a^2b^3)(2ab^4) \)

5. Multiply two binomials. Ex. \( (2x + 5)(x - 7) \)

6. Find an algebraic expression, in simplified form, for the perimeter of a polygon.

Ex:

7. and 8. Solve a variety of linear equations.

Ex. 1: \( 5(t + 3) + 9 = 3(t - 2) + 6 \)

Ex. 2: \( \frac{2}{3}x - \frac{3}{2}x = \frac{3}{4}x + 2 \)

9. Write an equation that would be used to solve a word problem, BUT DO NOT SOLVE:

Ex: If one is subtracted from seven times a certain number, the result is the same as if 31 is added to three times the number.

10. Solve a quadratic equation using factoring. Ex. \( x^2 - 6x + 5 = 0 \)