

**Publisher Questions to Western and Northern Canadian Protocol
(WNCP) Mathematics Team**

Grade 9 Patterns and Relations (Variables and Equations), SO 6 and 7

- 1. The Achievement Indicators for these outcomes suggest that all operations (addition, subtraction, multiplication and division) be done only concretely or pictorially, and the process recorded symbolically. There appears to be no expectation that these operations be done symbolically. The draft Common Grade 10 course (Foundations of Mathematics and Pre-Calculus, Grade 10) contains no mention of adding or subtracting polynomials, referring only (in Algebra and Number SO 4) to multiplying binomials. Should students in grade 9 ultimately be performing the required operations using symbols only?**

WNCP Response: Students should be allowed to select the representation that works best for them in a particular context and be able to explain their strategy. It is important that students be able to make connections between concrete, pictorial and symbolic representations.

- 2. In grade 9, students are only expected to cover the exponent laws for integer bases, and these are extended to variable bases in the draft Common Grade 10 course (Algebra and Number SO 3) so students cannot multiply polynomials using the exponent laws and can attach no meaning to the power of a variable, such as x^3 . So in SO 7, does the polynomial of degree less than to 2, refer to the product polynomial and not the factors of the product, the dividend and not the divisor or quotient?**

WNCP Response: Yes, the polynomial of degree less than or equal to 2 refers to the product and the dividend.

- 3. In Grade 9, Outcome PR7 indicates that students will model, record and explain the operations of multiplication and division of polynomial expressions by monomials. Is it correct to interpret that multiplying two binomials, or factoring a polynomial expression that is the product of two binomials, is therefore extraneous content?**

WNCP Response: Yes, this will be viewed as extraneous content since it is covered in future courses.