## Converting Algebraic Expressions to C++

One of the challenges of learning a new computer language is the task of changing algebraic expressions to their equivalent computer instructions.

*Example:* 4y(3-2)y+7

How would this algebraic expression be implemented in C++?

4 \* y \* (3-2) \* y + 7

Other expressions are a bit more challenging. Consider the quadratic formula:

–*b* ± *b*2 – 4*ac* 2*a*

We need to know how C++ handles functions such as the square root and squaring functions.

There are several predefined math library routines that are contained in the cmath library. In order to use these we must have the #include <cmath> directive in the header.

Exponents in C++ are handled by the pow(number,exp) function, where number indicates the base and exp is the exponent. For example,

23 would be written as pow (2,3)

59 would be written as pow (5,9)

Square roots are handled by sqrt(n). For example,  
 9 would be written as sqrt(9)

Look at the following C++ statements and try to determine what they are doing.

**formula1 = (-b + sqrt (pow (b, 2) - (4 \* a \* c))) / (2 \* a);**

**formula2 = (-b - sqrt (pow (b, 2) - (4 \* a \* c))) / (2 \* a);**

(These are the roots from the quadratic formula in C++ format.)

Write C++ expressions for the following algebraic expressions:

1. a=2b+4c 2. 3X + Y
2. y=x3 4. A2 + 2B + C
3. g= 6. g=
4. 9.