The Box Method
BoxMethod.tns

Name _____

Class _____

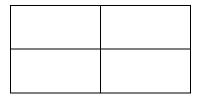**Activity**

Enter the quadratic term and the constant term into the indicated boxes (as shown on page 1.3).

Find the product of the first and last terms of the quadratic equation.

- $ax^2 \cdot c =$ _____

On page 1.4, type a number that could be a factor of $ax^2 \cdot c$ into the first column of the spreadsheet (do not include x in what you type in the box). The second column will be calculated for you. If the resulting factor pair is a pair of integers, consider the pair in the next step. If the result is not an integer, do not use this pair. Find several integer pairs.

Look at your list of possible factors and find a pair that sums to the middle term, bx. (You must attach the variable x onto each integer in the pair to check this.) Once you have identified the pair, store each on page 1.5.

- Record your pair here:

  $d =$ _____

  $e =$ _____

Place each new "factor" into the corresponding boxes of the table above (as shown on page 1.6). Make sure your dx and ex have the correct negative/positive signs so they correctly add to bx.

Don't forget to continue updating the boxes above as they change on the TI-Nspire screen!

On page 1.7, find the GCD of a and d (the terms in the left boxes) and store it as f. Then, find the GCD of c and e (the terms in the right boxes) and store it as g. You can always change these later if you make a mistake!

Then, repeat the procedure for a and e (the terms in the top boxes) and for c and d (the terms in the bottom boxes) on page 1.8. Store these values as h and j, respectively. Do not be dismayed if the expressions on your screen are rather crowded at this point.

- Record your expressions here:

  $f =$ _____ $g =$ _____ $h =$ _____ $j =$_____

These expressions will go outside of the boxes, as shown on page 1.9. (Think about the Distributive Property, and how each GCD term will correctly factor out of the terms inside of the box in that row or column.) The sum of the terms below the box is one of the factors of the polynomial. The sum of the terms to the right of the box is the other factor.
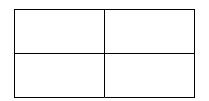
- Record the factors of the polynomial here and test by multiplying with FOIL.

Additional Practice

Return to page 1.3 and try some problems by yourself. Double click on the values of *a*, *b*, and *c* to change them. Remember to type **reset()** on page 1.11 before starting a new problem. Record your results in a box as modeled in the previous example.

1. $10x^2 + 17x + 3 =$

2. $9x^2 + 9x - 4 =$

3. $8x^2 + 22x + 5 =$

4. $6x^2 + 29x - 5 =$