



Activity

In this activity, you will find the factors of $12x^2 + -13x + -4$ using the Box Method. Start the program **BOXMTHD**. You will use this program as you work through this activity. Enter the quadratic term and the constant term into the indicated boxes (as shown on your calculator).

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

- $ax^2 \cdot c =$ _____

Use the table displayed by the program to identify possible factor pairs. The left column (**X**) provides one factor, the middle column (**Y1**) provides the second, and right column (**Y2**) shows the sum. Find the pair of factors that add to the needed sum. If you do not see a pair of factors whose sum is the **B** term, use the up and down arrows to scroll through the table.

Press **[ENTER]** and you will be asked to store these factors as **D** and **E**.

- Record your pair here: **D** = _____ **E** = _____

Place each new “factor” into the corresponding boxes of the table above. Make sure your **D** and **E** have the correct negative/positive signs so they correctly add to the **B** term.

Don't forget to update the boxes above as you learn more information!

Next, the program finds the GCD of **A** and **D** (the terms in the left column) and stores it as **F**. Then, the GCD of **C** and **E** (the terms in the right column) is stored as **G**.

Then the procedure is repeated for **A** and **E** (the terms in the top row) and for **c** and **d** (the terms in the bottom row). These values are stored as **H** and **J**, respectively.

- Record your values here:

F = _____ **G** = _____ **H** = _____ **J** = _____

These expressions will go outside of the boxes for their respective column or row. (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

Now try some problems by yourself. Record your results in a box as modeled in the previous example using the **BOXMTHD** program.

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

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

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

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