

## Beginning Algebra ~ Lesson 32

Work the following examples as you listen to the recorded lecture.

### Factoring Simple Trinomials

Problem type:  $x^2 + bx + c$  (Where  $b$  and  $c$  are numbers, and  $x$  is the unknown.)

#### Rules for signs:

**Rule 1:** If the **2<sup>nd</sup> sign is +**, then both factor signs will match the **1<sup>st</sup> sign** in the problem.

$$x^2 + bx + c \rightarrow ( \quad + \quad )( \quad + \quad ) \quad x^2 - bx + c \rightarrow ( \quad - \quad )( \quad - \quad )$$

**Rule 2:** If the **2<sup>nd</sup> sign is -**, then the factor signs will be different, + and -.

$$x^2 + bx - c \rightarrow ( \quad + \quad )( \quad - \quad ) \quad x^2 - bx - c \rightarrow ( \quad + \quad )( \quad - \quad )$$

**Rule 3:** Use 2<sup>nd</sup> operation to find out if you add or subtract factors to equal  $b$ .

#### Steps to remember:

1. Set the factor statement
2. Set the binomial factors with the signs
3. Factor the variable squares
4. Find all factors for "c" until one matches the factor statement
5. Place the factors in the 2<sup>nd</sup> positions of the binomial pairs
6. FOIL to check

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|------------------------------|--|
| Example 1:<br>$x^2 + 7x + 6$ | Step 1: Factor Statement:  |
| $( \quad ) ( \quad )$        | Step 2: Set signs for the factors.   |
|                              | Step 3: Factor the variable squares.   |
|                              | Step 4: Factor c<br>c = _____ <u>Factor Statement Work Space</u><br><br>_____<br>_____<br><br>Look for the combination that fits the factor statement. |
|                              | Step 5: Use the "c" factors in 2 <sup>nd</sup> positions of your solution.   |
|                              | Step 6: FOIL to check.   |



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| <p>Example 4:<br/> <math>13 + 14x + x^2</math></p> | <p>Step 1: Factor Statement:</p>   |
| <p>(        ) (        )</p>                       | <p>Step 2: Set signs for the factors.</p>  |
|  | <p>Step 3: Factor the variable squares.</p>  |
|  | <p>Step 4: Factor c<br/> <math>c = \underline{\hspace{2cm}}</math>        <i>Factor Statement Work Space</i><br/> <br/> <math>\underline{\hspace{2cm}}</math>        <math>\underline{\hspace{2cm}}</math><br/> <br/> <math>\underline{\hspace{2cm}}</math>        <math>\underline{\hspace{2cm}}</math><br/> <br/>           Look for the combination that fits the factor statement.</p> |
|  | <p>Step 5: Use the "c" factors in 2<sup>nd</sup> positions of your solution.</p>   |
|  | <p>Step 6: FOIL to check.</p>  |

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| <p>Example 5:<br/> <math>4x^2y + 4xy - 8y</math></p> | <p>Step 1: Factor Statement:</p>   |
| <p>(        ) (        )</p>                         | <p>Step 2: Set signs for the factors.</p>  |
|  | <p>Step 3: Factor the variable squares.</p>  |
|  | <p>Step 4: Factor c<br/> <math>c = \underline{\hspace{2cm}}</math>        <i>Factor Statement Work Space</i><br/> <br/> <math>\underline{\hspace{2cm}}</math>        <math>\underline{\hspace{2cm}}</math><br/> <br/> <math>\underline{\hspace{2cm}}</math>        <math>\underline{\hspace{2cm}}</math><br/> <br/> <math>\underline{\hspace{2cm}}</math>        <math>\underline{\hspace{2cm}}</math><br/> <br/>           Look for the combination that fits the factor statement.</p> |
|  | <p>Step 5: Use the "c" factors in 2<sup>nd</sup> positions of your solution.</p>   |
|  | <p>Step 6: FOIL to check.</p>  |