Factoring Trinomials of the Form x2 + bx + c

***REVIEW EXPANDING***

|  |  |  |
| --- | --- | --- |
| Distributive Property  Rainbow |  | |
| Product of Two Binomials  F O I L |  | |
| Perfect Square Binomial  Special Product |  | Recall |
| Difference of Squares  Special Product |  | Recall |

**Factor –** the numbers that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together to form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

i.e. 2 x 3 = 6 🡪 The factors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The product is \_\_\_\_\_\_\_\_\_\_

i.e.  🡪 The factors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The product is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Factoring Trinomials –** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**To factor a trinomial of the form x2 + bx + c**

Find two integers whose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is equal to \_\_\_\_ and whose \_\_\_\_\_\_\_\_\_ is equal to \_\_\_\_

You ***\_\_\_\_\_\_\_\_\_*** pay close attention to the ***\_\_\_\_\_\_\_\_\_*** of the terms.

***EXAMPLES***

**Factoring Trinomials**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1. x2 + 15x + 36 | |  |  |  | | --- | --- | --- | | Product of 36 | | Sum | | 1 |  |  | | 2 |  |  | | 3 |  |  | | 4 |  |  | | 6 |  |  | | 1. x2 + 7x – 18 | |  |  |  | | --- | --- | --- | | Product of -18 | | Sum | | 1 |  |  | | -1 |  |  | | 2 |  |  | | -2 |  |  | | 3 |  |  | | -3 |  |  | |

**Factoring PERFECT SQUARE Trinomial** 

If the **first term** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the **last term** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square,   
then you **MIGHT** have a perfect square trinomial

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. x2 – 10x + 25 | |  |  |  | | --- | --- | --- | | Product of 25 | | Sum | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |

This is an example of a \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

* + The first term is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and
  + The last term is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square and
  + The middle term (ignoring the sign) is \_\_\_\_\_\_\_ times the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the last term

To determine the sign of the factors:

* If the middle term is positive, then the factors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* If the middle term is negative, then the factors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Factoring DIFFERENCE OF SQUARES** 

* **WHEN** the **first term** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the **last term** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. x2 – 25  can also be written as  x2 + \_\_\_\_ x – 25 | |  |  |  | | --- | --- | --- | | Product of 25 | | Sum | |  |  |  | | OR | x2 – 25 |

1. x2 – 81

What are the 3 types of Factoring completed above?

|  |  |
| --- | --- |
|  |  |
|  |  |
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**Factoring Trinomials (x2 + bx + c) – Practice**

1. Complete the following table. The first one is done for you.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Integers | | Sum of the Integers  ***(b)*** | Product of the Integers  (***c)*** | Trinomial (Quadratic Expression) |
|
| 3 | 2 | 5 | 6 |  |
| - 1 | 9 |  |  |  |
| 5 |  |  | - 10 |  |
|  | 12 | 15 |  |  |
| - 6 | - 7 |  |  |  |
| 15 |  | 12 | - 45 |  |
| 4 | - 4 |  | - 16 |  |
| 7 |  | 14 |  |  |

1. Complete the following table. The first one is done for you.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Factors | Terms | | Sum of the terms | Product of the terms | Quadratic  **(*x*² + bx + c)** |
|  | + 4 | + 2 | + 6 | + 8 |  |
|  | + 2 |  | - 7 |  |  |
|  |  | - 7 |  | -35 |  |
|  | + 5 |  | 10 |  |  |
|  |  |  |  |  |  |
|  | - 3 | - 8 |  |  |  |
|  | - 6 |  | - 4 |  |  |
|  |  |  | 10 | 21 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. Factor, then check by expanding.

**a)** *x*2 + 12*x* + 32 **b)** *x*2 – 9*x* + 18

**c)** *x*2 – 2*x* – 3 **d)** *x*2 – 12*x* + 35

1. Factor each trinomial.

**a)** *x*2 – 3*x* – 18 **b)** *x*2 + 2*x* + 1

**c)** *x*2 – *x* – 56 **d)** *x*2 + 15*x* + 54

**e)** *x*2 + *x* – 56 **f)** *x*2 – 14*x* + 49

1. Factor, then check by expanding.

**a)** *x*2 – 9 **b)** *x*2 – 16

**c)** *x*2 – 36 **d)** *x*2 – 4

**e)** *x*2 – 225 **f)** *x*2 – 81

1. Factor, if possible.

**a)** *x*2 + 4*x* – 21 **b)** *x*2 + 6*x* + 4

**c)** *x*2 + 10*x* + 25 **d)** *x*2 – 6*x* + 7

**e)** *x*2 – 6*x* – 7 **f)** *x*2 + 36