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**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 – 25can also be written asx2 + \_\_\_\_ x – 25
 |

|  |  |
| --- | --- |
| Product of 25 | Sum |
|  |  |  |

 | OR | x2 – 25 |

1. x2 – 81

What are the 3 types of Factoring completed above?

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

**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