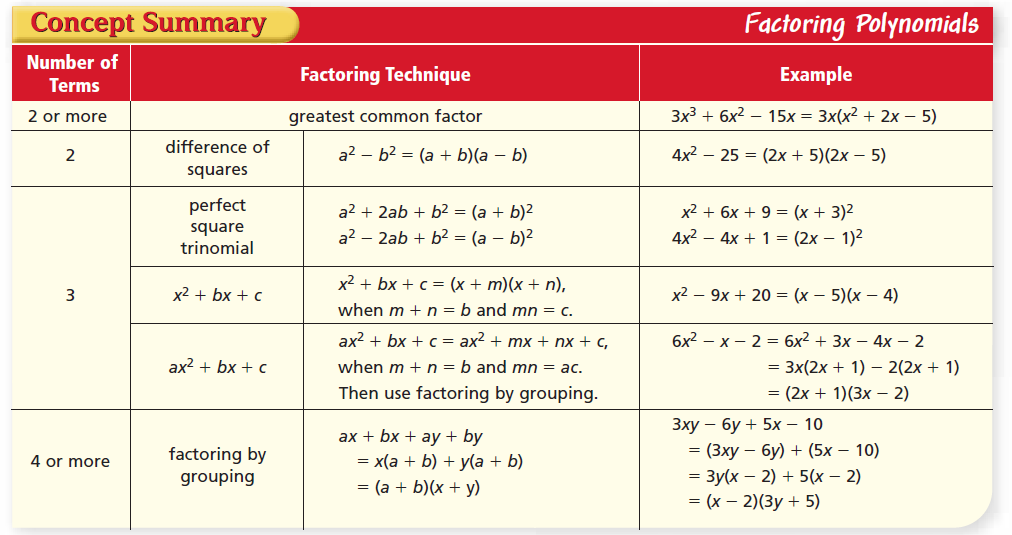
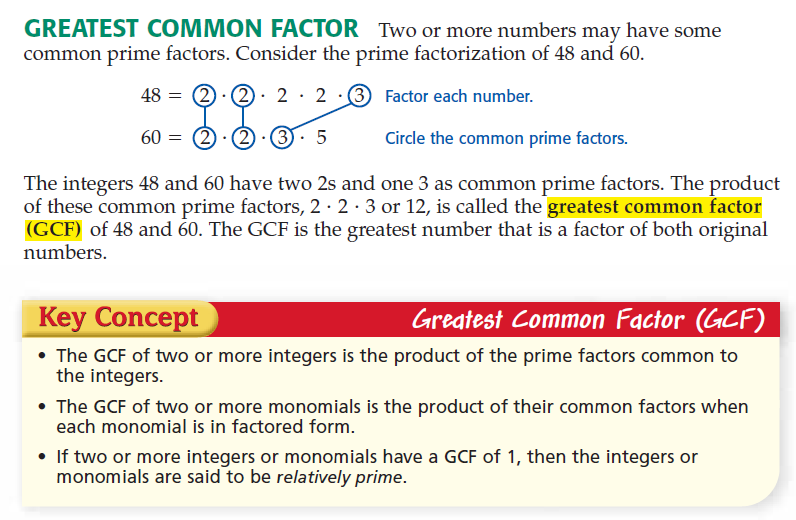
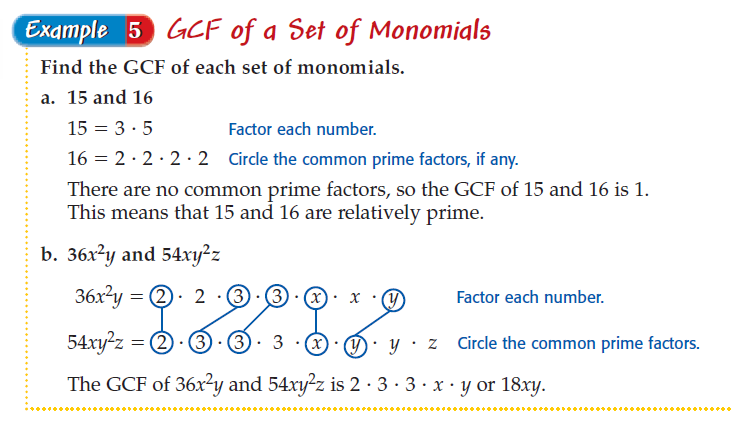
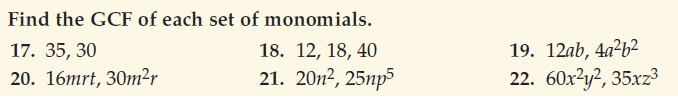
**Factoring**

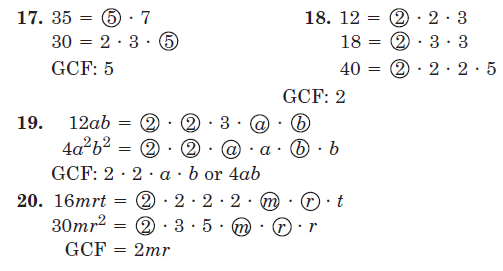
This is one of a series of review packets to refresh Algebra 1 topics for the Geometry student preparing to move on to Algebra 2. Examples, practice problems, and solutions are included.

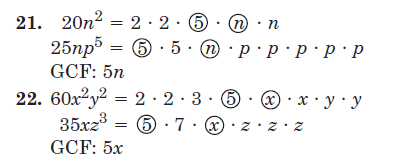












**Factoring Trinomials – Reference Sheet**

Example 1: Factor x2 + 9x + 20

* Rewrite as 1x2 + 9x + 20
* Multiply the coefficient of x2 and the constant term 1 ∙ 20 = 20
* Find two values such that \_\_\_ ∙ \_\_\_ = 20 and \_\_\_ + \_\_\_\_ = 9  
  (notice that 9 is the coefficient of the x term)
* 4 ∙ 5 = 20 and 4 + 5 = 9
* Use the two values 4 and 5 for the next step.
* Set up the box that was used to multiply polynomials

The center term in the box is the first term in the trinomial.

The bottom right corner of the box is the last term of the trinomial.

The other two terms are the new values that were determined and are written as the coefficient of x. It doesn’t matter which way you place these two terms in these two boxes.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | x2 | 4x |
|  | 5x | 20 |

* Find the GCF of each row and column

|  |  |  |
| --- | --- | --- |
|  | x | 4 |
| x | x2 | 4x |
| 5 | 5x | 20 |

* Identify the factors as (x+5)(x+4)
* Check your work by multiplying the factors.   
  If you get the original trinomial as your product, you know you have factored correctly.

**Factoring Trinomials – Reference Sheet**

The factors are not in order.

Example 2: Factor -4 – 3x + x2

* Rewrite as 1x2 – 3x – 4
* Multiply the coefficient of x2 and the constant term 1 ∙ -4 = -4
* Find two values such that \_\_\_ ∙ \_\_\_ = -4 and \_\_\_ + \_\_\_\_ = -3  
  (notice that -3 is the coefficient of the x term)
* 1 ∙ -4 = -4 and 1 + -4 = -3
* Use the two values 1 and -4 for the next step.
* Set up the box that was used to multiply polynomials

The center term in the box is the first term in the trinomial.

The bottom right corner of the box is the last term of the trinomial.

The other two terms are the new values that were determined and are written as the coefficient of x. It doesn’t matter which way you place these two terms in these two boxes.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | x2 | 1x |
|  | -4x | -4 |

* Find the GCF of each row and column

|  |  |  |
| --- | --- | --- |
|  | x | 1 |
| x | x2 | 1x |
| -4 | -4x | -4 |

* Identify the factors as (x – 4 )(x + 1)
* Check your work by multiplying the factors.   
  If you get the original trinomial as your product, you know you have factored correctly.

**Factoring Trinomials – Reference Sheet**

The coefficient of x2 is not 1.

Example 3: Factor 2x2 + 3x – 2

* Multiply the coefficient of x2 and the constant term 2 ∙ -2 = -4
* Find two values such that \_\_\_ ∙ \_\_\_ = -4 and \_\_\_ + \_\_\_ = 3  
  (notice that 3 is the coefficient of the x term)
* -1 ∙ 4 = -4 and -1 + 4 = 3
* Use the two values -1 and 4 for the next step.
* Set up the box that was used to multiply polynomials

The center term in the box is the first term in the trinomial.

The bottom right corner of the box is the last term of the trinomial.

The other two terms are the new values that were determined and are written as the coefficient of x. It doesn’t matter which way you place these two terms in these two boxes.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 2x2 | -1x |
|  | 4x | -2 |

* Find the GCF of each row and column

|  |  |  |
| --- | --- | --- |
|  | 2x | -1 |
| x | 2x2 | -1x |
| 2 | 4x | -2 |

* Identify the factors as (2x – 1 )(x + 2)
* Check your work by multiplying the factors.   
  If you get the original trinomial as your product, you know you have factored correctly.

This trinomial has a **GCF**.

**Factoring Trinomials – Reference Sheet**

Example 4: Factor 8x2 – 44x + 48

* Check to see if there is a **common** **factor** for all three terms.   
  If yes, factor it out. 4(2x2 – 11x + 12)
* Multiply the coefficient of x2 and the constant term 2 ∙ 12 = 24
* Find two values such that \_\_\_ ∙ \_\_\_ = 24 and \_\_\_ + \_\_\_ = -11  
  (notice that -11 is the coefficient of the remaining x term)
* -3 ∙ -8 = 24 and -3 + -8 = -11
* Use the two values -3 and -8 for the next step.
* Set up the box that was used to multiply polynomials

The center term in the box is the first term in the trinomial.

The bottom right corner of the box is the last term of the trinomial.

The other two terms are the new values that were determined and are written as the coefficient of x. It doesn’t matter which way you place these two terms in these two boxes.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 2x2 | -3x |
|  | -8x | 12 |

* Find the GCF of each row and column

Note: although initially it doesn’t look like -4 is a common factor for -8 and +12 or that -3 is a common factor for -3 and +12, you have to arrange the negative factors so that you can multiply back to get what you started with. -3 ∙ -4 will = +12.

|  |  |  |
| --- | --- | --- |
|  | 2x | -3 |
| x | 2x2 | -3x |
| -4 | -8x | 12 |

* Identify the factors as (4)(2x – 3 )(x – 4)  
  Don’t forget to include the **GCF** you factored out in the first step!
* Check your work by multiplying the factors.   
  If you get the original trinomial as your product, you know you have factored correctly.

