# Factoring a Quadratic (GCF)

**Date:**

**Standards**

A.SSE.1.a - Interpret parts of an expression, such as terms, factors, and coefficients.

A.SSE.2 - Use the structure of an expression to identify ways to rewrite it.

**Essential Questions**

- How can I simplify a polynomials?
- How can I simplify a polynomial by grouping?

How can I simplify polynomials?

$3x + 6$

| | $x$ | $2$ |
|---|---|---|
| $3$ | $3x$ | $6$ |

What do both terms have in common?

$3(x + 2)$

How can I simplify polynomials?

$$2x - 10$$

| | $x$ | $-5$ |
|---|---|---|
| $2$ | $2x$ | $-10$ |

What do both terms have in common?

$$2(x - 5)$$

How can I simplify polynomials?

$$9 - 3x$$

| | $3$ | $-x$ |
|---|---|---|
| $3$ | $9$ | $-3x$ |

What do both terms have in common?

$$3(3 - x)$$

How can I simplify polynomials?

$$x^2 - 4x$$

| | $x$ | $-4$ |
|---|---|---|
| $x$ | $x^2$ | $-4x$ |

What do both terms have in common?

$$\mathbf{x}(x - 4)$$

How can I simplify polynomials?

$$5x^2 + 10x$$

| | $x$ | $2$ |
|---|---|---|
| $5x$ | $5x^2$ | $10x$ |

What do both terms have in common?

$$5x(x + 2)$$

How can I simplify polynomials?

$$7x^2 + 14x$$

| | $x$ | $2$ |
|---|---|---|
| $7x$ | $7x^2$ | $14x$ |

What do both terms have in common?

$$7x(x + 2)$$

How can I simplify a polynomials by grouping?

$$4ab + 8b + 3a + 6$$

Nothing can be factored from all four!!

**Lets focus on $4ab + 8b$**

| | $a$ | $2$ |
|---|---|---|
| $4b$ | $4ab$ | $8b$ |

What do both terms have in common?

$$4b(a + 2)$$

How can I simplify polynomials?

$$4ab + 8b + 3a + 6$$

Nothing can be factored from all four!!

## Lets focus on $3a + 6$

| | $a$ | $2$ |
|---|---|---|
| $3$ | $3a$ | $6$ |

What do both terms have in common?

$$3(a + 2)$$

How can I simplify polynomials?

$$4b(a+2)+3(a+2)$$

What do both sides have in common?

**We will re-write this:**

$$(4b+3)(a+2)$$

**Why?!?!?!**

How do I multiply two binomials together?

$$(4b + 3)(a + 2)$$

| | 4b | 3 |
|---|---|---|
| a | $4ba$ | $3a$ |
| 2 | $8b$ | $6$ |

$$4ba + 3a + 8b + 6$$

How can I simplify polynomials?

$$6x^2 - 15x - 8x + 20$$

Nothing can be factored from all four!!

**Lets focus on $6x^2 - 15x$**

| | $2x$ | $-5$ |
|---|---|---|
| $3x$ | $6x^2$ | $-15x$ |

What do both terms have in common?

$$3x(2x - 5)$$

How can I simplify polynomials?

$$6x^2 - 15x - 8x + 20$$

Nothing can be factored from all four!!

**Lets focus on $-8x + 20$**

| | $-2x$ | $5$ |
|---|---|---|
| $4$ | $-8x$ | $20$ |

What do both terms have in common?

$$4(-2x + 5)$$

How can I simplify polynomials?

$$3x(2x-5)+4(-2x+5)$$

What do both sides have in common?

But they have different signs!!!!

$$3x(2x-5)-4(2x-5)$$

**We will re-write this:**

$$(3x-4)(2x-5)$$

**REFLECTION**:

1) Answer one of the essential questions
2) How have previous lessons helped or connect with this lesson?
3) What are you still confused on or what new info did you learn?

# Homework: Factoring - GCF

Factor the following polynomials

*1)* $12a^2 + 16a$

*2)* $17d^3 + 5d$

*3)* $6x - 8$

*4)* $rs - 5s - r - 5$

*5)* $5x^2 - 35 + 3x - 21$

*6)* $3n^2 + 6n$