

High School Algebra 1 Topic 7 - FCPS 2025-2026

Topic 7: Polynomials and Factoring		Estimate Time Frame: 10 blocks
<p>Essential Standards: KY.HS.A.1, KY.HS.A.2, KY.HS.A.3ab, KY.HS.A.5 Supporting Standards: KY.HS.A.7, KY.HS.N.4, KY.HS.N.5, KY.HS.N.6</p> <p>Assessment Resource: enVision Topic 7</p>		
FCPS Supporting Links		Additional Supporting Links
<p>Pacing Guide</p> <p>Standards Resources Crosswalk</p> <p>FCPS P-12 Mathematics Guidance Document</p> <p>FCPS Achievement & Trauma-Informed Strategies in the Classroom</p>		<p>Kentucky Academic Standards</p> <p>KSA Blueprint</p> <p>Target of the Standards - conceptual, procedural & application</p> <p>Three-Reads Routine</p> <p>Notice and Wonder Routine</p> <p>MILC Resources: Topic 7 Polynomials and Factoring</p> <p><i>enVision Teacher Guide: page 264A to 264I for specific Topic 7 Focus-Coherence-Rigor</i></p>
Big Ideas		
<p>Perform operations on polynomials. Using the structures of polynomials to rewrite them in factored form.</p>		
Essential Questions		Common Preconceptions/Misconceptions
<p>How do you work with polynomials to rewrite expressions and solve problems?</p> <p>How can the properties of the real number system be beneficial when working with polynomials and rational expressions?</p> <p>What is the relationship between factoring and multiplying?</p>		<ul style="list-style-type: none"> ● Ensure that students know what closure means by working with integers and subsets of integers with addition, subtraction, multiplication, and division. ● Skills Previously Taught: <ul style="list-style-type: none"> ○ Explain <i>how to name</i> a polynomial. ● A common misconception for students occurs when adding and multiplying like terms if students have not used manipulatives or models before learning the rules.

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	<p>One method to address this is introducing polynomials using Algeblocks or Algebra Tiles. Both are available for checkout from the District Math Lab in the Teacher Resource Center at the Central Office or from Math Chairs.</p>	
Standards for Mathematical Practices	Kentucky Interdisciplinary Literacy Practices (KILP)	
<p>MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.</p> <p><i>enVision Teacher Guide: page 264D for specific Topic 7 Math Practice suggestions</i></p>	<ol style="list-style-type: none"> 1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schemas to understand and create text. 3. View literacy experiences as transactional, interdisciplinary, and transformational. 4. Utilize receptive and expressive language arts to better understand self, others, and the world. 5. Apply strategic practices, with scaffolding and then independently, to approach new literacy tasks. 6. Collaborate with others to create new meaning. 7. Utilize digital resources to learn and share with others. 8. Engage in specialized, discipline-specific literacy practices. 9. Apply high-level cognitive processes to think deeply and critically about text. 10. Develop a literacy identity that promotes lifelong learning. <p><i>Incorporating texts into math instruction fosters interdisciplinary learning for a more engaging educational experience.</i></p>	
Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Write expressions in equivalent forms to solve problems.		
<p>KY.HS.A.3 Choose and produce an equivalent form of an expression to reveal and explain the properties of the quantity represented by the expression. ★</p> <p>a. Write the standard form of a given polynomial and identify the terms, coefficients, degree, leading coefficient, and constant term.</p> <p>b. Factor a quadratic expression to reveal the zeros of the function it defines.</p> <p>MP.5, MP.7, KILP.2, KILP.3</p>	<p>I am learning to manipulate polynomial expressions to reveal and explain their properties.</p> <ul style="list-style-type: none"> ● I can write a polynomial in standard form. ● I can identify a polynomial's terms, coefficients, degrees, leading coefficients, and constant terms. 	<ul style="list-style-type: none"> ● Supplement resources for polynomials part a of the standard.

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Conceptual Procedural Application

Considerations:

Name	Product of Powers	Quotient of Powers	Power of a Product	Power of a Quotient	Power of a Power	Negative Exponent
Property	$a^m \cdot a^n = a^{m+n}$	$\frac{a^m}{a^n} = a^{m-n}$	$(a \cdot b)^n = a^n \cdot b^n$	$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$	$(a^m)^n = a^{mn}$	$a^{-n} = \frac{1}{a^n}$

Supporting Standards: KY.HS.A.1, KY.HS.A.2, KY.HS.A.10, KY.HS.A.11(+), KY.HS.A.13, KY.HS.N.1

Attending to the Standards for Mathematical Practice

Students explain that they need to rewrite quadratic expressions into equivalent factored forms to find the zeros of the function it defines (MP.7).
Using technology, students change the exponents to reinforce their understanding of exponent properties (MP.5).

Essential Standards

Sample Learning Intentions & Success Criteria

HQIR/Resource Considerations

Cluster: Perform arithmetic operations on polynomials.

KY.HS.A.5 Add, subtract, and multiply polynomials.

MP.7, MP.8, KILP.6

Supporting Standards: [KY.HS.A.1](#)

Conceptual Procedural Application

Considerations: Students combine like terms and use the distributive property when adding, subtracting, and multiplying polynomials.

I am learning to add and subtract polynomials.

- I can use the properties of exponents to combine like terms.
- I can add polynomials by combining like terms and simplifying the resulting expression.
- I can subtract polynomials by distributing the subtraction operation and simplifying the resulting expression.

I am learning to multiply polynomials, including special cases.

- I can use the Distributive Property to multiply polynomials, recognizing that polynomials are closed under multiplication.
- I can combine like terms when simplifying the polynomial.
- I can use the pattern $(a + b)^2 = a^2 + 2ab + b^2$ to

- **** Use Algebra Tiles OR Algeblocks to introduce Polynomials!**
- Lesson 7-1: Adding and Subtracting Polynomials
- Lesson 7-2: Multiplying Polynomials
- Lesson 7-2: Multiplying Special Cases
- Desmos: [Introduction to Polynomials through Algebra Tiles](#)

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	<p>determine the square of a binomial.</p> <ul style="list-style-type: none"> I can find the product of a sum and the difference of two squares. 	
Attending to the Standards for Mathematical Practice		
<p>Students flexibly rewrite expressions in equivalent forms using algebraic properties, including properties of addition, subtraction, and multiplication (MP.7). When multiplying binomials, students identify and describe shortcuts after noticing that calculations are repeated (MP.8).</p>		
Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Interpret the structure of expressions.		
<p>KY.HS.A.1 Interpret expressions that represent a quantity in terms of its context. ★</p> <p>a. Interpret parts of an expression, such as terms, factors and coefficients.</p> <p>b. Interpret complicated expressions, given a context, by viewing one or more of their parts as a single entity. MP.2, MP.6</p> <p>Considerations: Students encounter simpler scenarios where they interpret $r \cdot t$ as the product of a given rate and time or interpret the perimeter expression $(2l+2w)$ contextually as the sum of twice the length and twice the width of a rectangle. Students encounter more complicated scenarios where they interpret $P(1+r)^n$ contextually as the product of a principal investment, P, and $(1+r)^n$ representing an investment rate, compounding factor, and time.</p>		<ul style="list-style-type: none"> Lesson 7-5: Factor $x^2 + bx + c$ 3-Act Task: Whose Right? Lesson 7-6: Factor $ax^2 + bx + c$ Lesson 7-7: Factoring Special Cases
<p>KY.HS.A.2 Use the structure of an expression to identify ways to rewrite it and consistently look</p>		<ul style="list-style-type: none"> Lesson 7-5: Factor $x^2 + bx + c$

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<p>for opportunities to rewrite expressions in equivalent forms. MP.7, MP.8</p> <p>Considerations: Students see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares factored $(x^2 - y^2)(x^2 + y^2)$. Additionally, students see three commonly used forms for a quadratic expression: • Standard form • Factored form • Vertex form, and can identify when one form might be more useful than another.</p>		<ul style="list-style-type: none"> • Lesson 7-6: Factor $ax^2 + bx + c$ • Lesson 7-7: Factoring Special Cases
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Attending to the Standards for Mathematical Practice

Students not only simplify problems but also use vocabulary, such as terms, coefficients, and degrees, appropriately as they describe their process (MP.6). They describe the meaning of parts of an expression, such as a particular term or coefficient, and also explain the meaning of the full expression (MP.7).
Students fluently manipulate expressions into equivalent forms based on patterns they have noticed across problems (MP.8).

Supporting Standards

KY.HS.N.4 Use units in context as a way to understand problems and to guide the solution of multi-step problems; ★ **MP.5, MP.6**
a. Choose and interpret units consistently in formulas;
b. Choose and interpret the scale and the origin in graphs and data displays.

KY.HS.N.5 Define appropriate units in context for the purpose of descriptive modeling. ★ **MP.1, MP.6**

KY.HS.N.6 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. ★ **MP.2, MP.6**

KY.HS.A.7 Identify roots of polynomials when suitable factorizations are available. These roots become the zeros (x-intercepts) for the corresponding polynomial function. **MP.2, MP.5, MP.7**

Vocabulary

polynomial - a function consisting of monomials or a sum or difference of monomials

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Supporting Vocabulary - monomial, binomial, trinomial, factor, product

*Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. This example is not comprehensive.

** Mathematical Practices (A.MP. 1- 8) should be evidenced at some point throughout each unit, depending on the explored tasks. It is important to note that MP. 2 should support learning in every lesson.

*** Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to *all* standards in that group.