

Richmond Public Schools
Department of Curriculum and Instruction
Curriculum Pacing And Resource Guide – Unit Plan



Course Title/ Course #: Algebra 1

Unit Title/ Marking Period # (MP#3): Law of Exponents & Polynomials

Start day:

Meetings (Length of Unit): 13

Desired Results ~ What will students be learning?

Standards of Learning/ Standards

A.2a-c

The student will perform operations on polynomials, including

- a) applying the laws of exponents to perform operations on expressions;
- b) adding, subtracting, multiplying, and dividing polynomials; and
- c) factoring completely first- and second-degree binomials and trinomials in one or two variables. Graphing calculators will be used as a tool for factoring and for confirming algebraic factorizations.

Essential Understandings/ Big Ideas

The laws of exponents can be investigated using inductive reasoning.

- A relationship exists between the laws of exponents and scientific notation.
- Operations with polynomials can be represented concretely, pictorially, and symbolically.
- Polynomial expressions can be used to model real-world situations.
- The distributive property is the unifying concept for polynomial operations.
- Factoring reverses polynomial multiplication.
- Some polynomials are prime polynomials and cannot be factored over the set of real numbers.
- Polynomial expressions can be used to define functions and these functions can be represented graphically.
- There is a relationship between the factors of any polynomial and the x-intercepts of the graph of its related function.

Key Essential Skills and Knowledge

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to

- Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents.
- Model sums, differences, products, and quotients of polynomials with concrete objects and their related pictorial representations.
- Relate concrete and pictorial manipulations that model polynomial operations to their corresponding symbolic representations.
- Find sums and differences of polynomials.
- Find products of polynomials. The factors will have no more than five total terms (i.e. $(4x+2)(3x+5)$ represents four terms and $(x+1)(2x^2+x+3)$ represents five terms).
- Find the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor.
- Factor completely first- and second-degree polynomials with integral coefficients.
- Identify prime polynomials.
- Use the x-intercepts from the graphical representation of the polynomial to determine and confirm its factors.

Vocabulary

Laws of Exponents
Product Rule
Quotient Rule
Power Rule
Negative Exponents
Polynomial Operations
Factor
Prime Polynomial
GCF
Difference of Two Squares
Binomial
Trinomial
Polynomial
Integral Coefficients
X- and Y- Intercepts
FOIL
Distributive Property
Scientific Notation

Assessment Evidence ~ What is evidence of mastery? What did the students master & what are they missing?

Assessment/ Evidence

Mulligan Checkpoint A.2

Interactive Achievement

[York County Practice Items](#)

Learning Plan ~ What are the strategies and activities you plan to use?

Learning Experiences/ Best Practice

Create a foldable for:

- Laws of Exponents & Negative Exponents
- Polynomial Operations
- Different Methods of Factoring a Polynomial

All Things Algebra → Exponent Rules → Activities

- Exponent Rules Koosh Ball Game
- Exponent Rules Coloring Activity
- Exponent Rules Rolling Review
- Exponent Rules Triples Activity
- Exponent Rules Scavenger Hunt

All Things Algebra → Polynomials & Factoring → Activities

- Adding and Subtracting Polynomials Math Lib
- Factoring Spin to Win
- Factoring Trinomials Math Lib
- Gone Fishin' with Factoring
- Gone Fishin' with Polynomials
- Polynomials Operations Math Lib
- Factoring a GCF (Drag & Drop Activity)
- Factoring a GCF (I Have Who Has Cards)
- Factoring Find Someone Who
- Factoring Polynomials Task Cards (with QR Codes)

- Factoring Trinomials Battleship Partner Activity
- Factoring Trinomials Task Cards (a=1)
- Multiplying Polynomials Coloring Activity
- Polynomials Scavenger Hunt
- Polynomials Triples Activity

Technology Integrations

Gizmo
Khan Academy
Discovery Streaming
Algebra Tiles

Resources

A.2a:

Text

Virginia Glencoe, Algebra I, ©2012, Carter, et al,
McGraw-Hill School Education Group, page(s) 401 - 422

Coach book, Virginia edition, page(s) 16 - 20

Mulligan Math in Minutes A.2

Technology

- Gizmo
 - [Exponents & Power Rules](#)
 - [Multiplying Exponential Expressions](#)
 - [Dividing Exponential Expressions](#)
- [Khan Academy](#)
 - [Exponent Equations](#)

Virginia Department of Education

[Exponents](#)

[Scientifically Speaking](#)

Other Sites

[Henrico Algebra 1 Online – A.2](#)

A.2b:

Text

Virginia Glencoe, Algebra I, ©2012, Carter, et al,
McGraw-Hill School Education Group, page(s) 423 - 458

Coach book, Virginia edition, page(s) 21 - 32

Mulligan Math in Minutes A.2

Technology

- Gizmo
 - [Addition of Polynomials – Activity B](#)
 - [Dividing Polynomials Using Synthetic Division](#)
- [Khan Academy](#)
 - [Introduction to Polynomials and Factoring](#)
- [Discovery Streaming](#)
 - [Polynomials in Real Life](#)

Virginia Department of Education

[Adding and Subtracting Polynomials Using Algebra Tiles](#)

[Multiplying Polynomials Using Algebra Tiles](#)

[Dividing Polynomials Using Algebra Tiles](#)

Other Sites

[Henrico Algebra 1 Online – A.2](#)

A.2c:

Text

Virginia Glencoe, Algebra I, ©2012, Carter, et al,
McGraw-Hill School Education Group, page(s) 469 – 490

Coach book, Virginia edition, page(s) 33- 38, 141 - 146

Mulligan Math in Minutes A.2

Technology

- Gizmo
 - [Modeling the Factorization of \$x^2 + bx + c\$](#)
 - [Quadratics in Factored Form](#)

- [Khan Academy](#)
 - [Introduction to Polynomials and Factoring](#)

- [Discovery Streaming](#)
 - [Punkin' Chunkin'](#)

Virginia Department of Education
[Factoring](#)

Other Sites

[Henrico Algebra 1 Online – A.2](#)

Cross Curricular Connection

Science: Working with scientific notation uses the law of exponents.

History: Research on the discovery of polynomials and how they were first used.

Writing: Explain the steps to factor a polynomials in the form of a letter to a friend who needs help.