Updated August 2024

Marking Period	Unit Title	Recommended Instructional Days
2	Polynomial Equations and Factoring	20-25 days

Domain: Algebra

NJ Student Learning Standards
(Taught and Assessed):

Key:
Major Cluster
Supporting Cluster
Additional Cluster

A.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$

Progress Indicators:

● ***Tests*** ● ***Quizzes*** ● ***Homework and Classwork*** ● ***Online Activities*** ● ***Projects***

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

Essential Question(s):

1. **What are polynomial expressions, and how do you simplify them?**
2. **How do you add and subtract polynomials?**
3. **How can you multiply polynomials by monomials?**
4. **How do you interpret algebraic expressions in terms of their context?**
5. **How can you use factoring to solve quadratic equations in standard form for which a = 1?**
6. **How can you use factoring to solve quadratic equations in standard form for which a ≠ 1?**
7. **How can you use special products to aid in solving quadratic equations by factoring?**

Activity Description(s):

- **Adding and subtracting Polynomials**
- **Multiplying and dividing polynomials**
- **Special products of polynomials**
- **Solving polynomial equations in factored form**
- **Factoring** $x^2 + bx + c$
- **Factoring** $ax^2 + bx + c$
- **Factoring special products**
- **Factoring polynomials completely**

Interdisciplinary Connections: Science.
Skills **Content:**Growing cell cultures and substance's effects.
NJSLS#: : S.CP.A.1, S.CP.A.2, S.CP.A.3, S.CP.A.5)
(Next Generation Science Standards ETS1-2)

as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

A.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★

a. Factor a quadratic expression to reveal the zeros of the function it defines.
b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
c. Use the properties of exponents to transform expressions for exponential functions. For example, the expression 1.15^t can

A scientist is growing cell cultures and examining the effects of various substances on them as part of his research. The culture in one petri dish increases according to the expression $t^2 + 4t + 4$ for time t in minutes. Another increases according to $t^2 + 2t + 4$. He needs to feed all the cells equally, so he needs to know the expression for the total number of cells in both dishes because the food is proportional to the total number of cells. Find the expression.

Answer: **$2t^2 + 6t + 8$**

Spotlight on:
"The Mathematicians Project: Mathematicians Are Not Just White Dudes"
Take 10-15 minutes a week to research (read Wikipedia, that's all you need) a not-old-dead-white-dude mathematician, and then take 5 minutes in class to tell your students about them. Include a picture.

Example Tasks:

Task 1

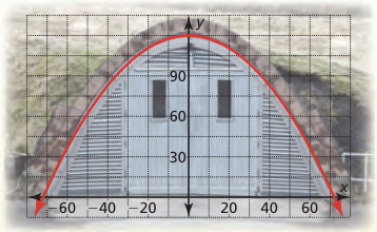
Find the sum or difference.

3. $(3a + 7) + (a - 1)$
4. $(x^2 + 6x - 5) + (2x^2 + 15)$
5. $(-y^2 + y + 2) - (y^2 - 5y - 2)$
6. $(p + 7) - (6p^2 + 13p)$

Task 2

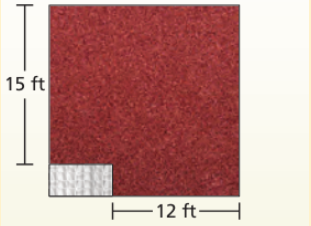
be rewritten as $\left(1.15^{1/12}\right)^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

The front of a storage bunker can be modeled by $y = -\frac{5}{216}(x - 72)(x + 72)$, where x and y are measured in inches. The x-axis represents the ground. Find the width of the bunker at ground level.



Task 3

A contractor tiles a rectangular section of fl oor in a square room. The tile covers 18 square feet. What is the area of the room?



Mathematics Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
Self-Awareness	Recognizing the importance of self-confidence in handling daily tasks and challenges.
Social Awareness	Demonstrate an awareness of the expectations for social interactions in a variety of ways.
Self-Management	Demonstrate an understanding of the need for mutual respect when viewpoints differ.
Relationship Skills	Recognize the skills needed to establish and achieve personal and educational goals.
Responsible Decision-Makin	Utilize positive communication and social skills to interact effectively with others.
	Develop, implement, and model effective problem solving and critical thinking skills.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Entry and Exit Slips ● Homework and Classwork ● Quizzes	**Benchmarks:** ● Tests ● Projects

• Self Assessments	**<u>Other Summative Assessments:</u>** • District Assessments • Midterm and/or Final Exams • Standardized Tests

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• Big Ideas • Achieve the core • Khan Academy • Desmos	• Skill building worksheets • Math Manipulatives • Guided notes • Guided Practice • (other alternate core resources)	• Bilingual editions, if available • Dictionary for native languages • Videos in students' native language. • Mathematical Literacy and vocabulary activity • (other ELL resource)	• Leveled Assessments • Enrichment Activities • (other G&T resources)

Supplemental Resources

Technology:
- **Chromebooks, Scientific and Graphing Calculators, Online Math Activities (Desmos, Digital interactive notebooks, Kahoot, Edulastic, Quizlet, Kuta Software, BOOM Cards, EDPUZZLE, Thatquiz.org, QUIZIZZ, BLOOKET, JAMBOARD, Peardecks, Nearpod, Socrative, IXL Diagnostic Arena, Prodigy, etc.)**

Other:
- **Google Meets or Zoom, Schoology, Interactive Textbooks**

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**

• Deliver instruction for varied learning styles (auditory, visual, tactile/kinesthetic, etc) • Provide individual instruction as needed • Modify assessments and/or rubrics as needed.	• Utilize a multi-sensory (VAKT) approach during instruction • Provide alternatives to skill development by varying the methods (repetition, simple explanations, additional examples, modeling, etc.) • Modify test content and/or format • Allow students to retake or correct tests for additional credit • Provide additional time and preferential seating as needed • Review, restate and repeat directions • Provide study guides, and/or break assignments into segments or shorter tasks, etc.	• Extend allowable time if possible and as needed • Preferred seating • Positive reinforcement • Check often for understanding • Oral/visual directions/prompts when necessary • Supplemental materials (ie. online bilingual dictionary) • Modified assessments and/or rubrics • Other Accommodations and Modifications for ESL Students	• Create an enhanced set of introductory activities • Integrate active teaching/learning opportunities • Incorporate authentic components • Propose interest-based extension activities, and/or additional interdisciplinary connections, etc.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept: Digital Citizenship**	
	Core Ideas:	**Cultivating online reputations for employers and academia requires separating private and professional digital identities.**
	Performance Expectation/s:	**9.4.12.DC.6: Select information to post online that positively impacts personal image and future college and career opportunities.**
	Career Readiness, Life Literacies, & Key Skills Practices	
	Act as a responsible and contributing community member and employee. **Attend to financial well-being.** **Consider the environmental, social and economic impacts of decisions.** **Demonstrate creativity and innovation.** **Utilize critical thinking to make sense of problems and persevere in solving them.** **Model integrity, ethical leadership and effective management.**	

	Plan education and career paths aligned to personal goals. **Use technology to enhance productivity, increase collaboration and communicate effectively.** **Work productively in teams while using cultural/global competence.**

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	x	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*