

Honors CCM2 – Unit 4 –Quadratics

Notes and Activities

Name: _____

Date: _____ Pd: _____

Unit Objectives:

F-LE.3: Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-SSE.1 Interpret expressions that represent a quantity in terms of its context.

a. Interpret parts of an expression, such as terms, factors, and coefficients.

b. Interpret complicated expressions by viewing one or more of their parts as a single entity.

F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

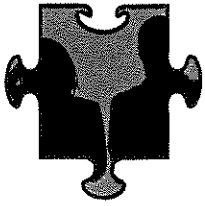
F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

| Date | Lesson |
|-------------------|--|
| Thursday 3/3 | FOIL/Factoring |
| Friday 3/4 | Solving Algebraically and Graphically |
| Monday 3/7 | Finding extrema from averaging zeros and graphing |
| Tuesday 3/8 | Discriminant |
| Wednesday 3/9 | Review and Quiz |
| Thursday 3/10 | Quadratic Formula |
| Friday 3/11 | Quadratic Inequalities |
| Monday 3.14 | Systems of Linear and Quadratic |
| Tuesday 3/15 | Fred Functions and Transformations of Quadratics |
| Wednesday 3/16 | Review |
| Thursday 3/17 | Test |
| Fri 3/18–Mon 3/21 | Midterm Review |
| Tuesday 3/22 | 1st and 3rd Midterms, 2nd and 4th Regular Classes |
| Wednesday 3/23 | 2nd and 4th Midterms, 1st and 3rd Regular Classes |
| Thursday 3/24 | Midterm Make ups if absent 3/22 or 3/23 Fruit Lab or Project Day |

Why Is a Stick of Gum Like a Sneeze?

For each exercise, multiply the two polynomials. Find your answer in the set of answers under the exercise. Cross out the letter above your answer. When you finish, the answer to the title question will remain!

| | | | | | |
|---|--------------------|----|-----------------------|----|---------------------------|
| 1 | $(x + 3)(x + 5)$ | 7 | $(4a - 7)(3a - 2)$ | 13 | $(n + 2)(n^2 + 5n - 3)$ |
| 2 | $(x + 2)(x + 9)$ | 8 | $(2a + 5)(2a - 5)$ | 14 | $(3n - 1)(2n^2 + 4n + 4)$ |
| 3 | $(x - 8)(x + 1)$ | 9 | $(6a - 1)(2a + 4)$ | 15 | $(2n + 3)(6n^2 - 2n + 1)$ |
| 4 | $(x - 3)(x - 6)$ | 10 | $(a + 2b)(4a + b)$ | 16 | $(4n - 5)(n^2 - 7n - 2)$ |
| 5 | $(2x + 9)(x - 2)$ | 11 | $(5a + 3b)(a - 4b)$ | 17 | $(3n - 4)(4n^2 + 2n + 3)$ |
| 6 | $(3x + 1)(2x + 4)$ | 12 | $(3a - 8b)(2a - b)$ | 18 | $(n + 8)(6n^2 - n - 4)$ |
| B | $x^2 - 7x - 8$ | T | $4a^2 + 9ab + 2b^2$ | T | $6n^3 + 47n^2 - 12n - 32$ |
| E | $x^2 + 8x + 15$ | I | $6a^2 - 19ab + 8b^2$ | C | $6n^3 + 44n^2 - 9n - 32$ |
| S | $6x^2 + 7x + 4$ | S | $5a^2 - 11ab - 12b^2$ | R | $4n^3 - 33n^2 + 27n + 10$ |
| I | $6x^2 + 14x + 4$ | E | $12a^2 + 22a - 4$ | I | $6n^3 + 10n^2 + 8n - 4$ |
| A | $x^2 - 9x + 18$ | R | $4a^2 - 25$ | H | $n^3 + 6n^2 + 9n - 6$ |
| U | $x^2 + 11x + 18$ | A | $4a^2 + 4ab + 3b^2$ | E | $12n^3 - 9n^2 - 2n - 12$ |
| T | $x^2 - 13x + 18$ | N | $5a^2 - 17ab - 12b^2$ | A | $12n^3 - 10n^2 + n - 12$ |
| N | $2x^2 + 5x - 18$ | O | $12a^2 - 29a + 14$ | N | $n^3 + 7n^2 + 7n - 6$ |
| | | | | W | $4n^3 - 30n^2 + 21n + 10$ |
| | | | | D | $12n^3 + 14n^2 - 4n + 3$ |



PERSON PUZZLE FACTORING WITH GCF

NAME _____ DATE _____

JAIME ESCALANTE

Told by many that his inner-city students were “unteachable”, Jaime Escalante (1930 – 2010) refused to lower his expectations and pushed them to new, astonishing heights. One of America’s most famous educators during the 1980’s, Escalante received international attention for his success and his story was the subject of a Hollywood feature film. His thirty-six year teaching career resulted in many local and national honors.



DIRECTIONS: Factor the greatest common factor out of each expression. If the GCF is 1, the answer is “prime”. The word or phrase next to the equivalent expression will complete the statement correctly.

1. $6x^2 + 10x$

Jaime Escalante was born in La Paz, _____.

- a. $2x(3x + 5)$ Bolivia
- b. $x(6x + 10)$ Brazil
- c. $2x(6x + 10)$ Paraguay

2. $18b - 24$

Escalante taught math and physics for _____ years before immigrating to the United States.

- a. Prime eight
- b. $3(6b - 8)$ ten
- c. $6(3b - 4)$ twelve

3. $7ab + 9cd$

Before becoming a teacher in the US, Escalante had to teach himself English and _____.

- a. Prime earn another degree
- b. $7(ab - 2cd)$ pass a licensure exam
- c. $ab(7 - 9cd)$ work as a teacher assistant

4. $14y^3 - 63y^2 - 21y$

In 1974, Escalante began teaching at Garfield High School in _____.

- a. $7y^2(2y^2 - 9y - 3)$ Chicago, IL
- b. $7y(2y^2 - 9y - 3)$ Los Angeles, CA
- c. $y(14y^2 - 63y - 21)$ New York, NY

5. $100v^9 + 50v^6 - 75v^3$

Surrounded with drugs and violence at the school, Escalante started a(n) _____ class to change the culture.

- a. $25v^3(4v^6 + 2v^3 - 3)$ AP Calculus
- b. $5v^3(20v^6 + 10v^3 - 15)$ Personal Finance
- c. $50v^3(2v^6 + v^3 - 25)$ Statistics

6. $36ab^2 - 96a^3b$

His students scored so well, the results were invalidated by the _____. They were forced to retake it because it was believed they cheated.

- a. $3ab(12b - 32a^2)$ local university
- b. $4a^3b^2(9 - 24a)$ school board
- c. $12ab(3b - 8a^2)$ testing service

7. $20k^7 - 4k^6$

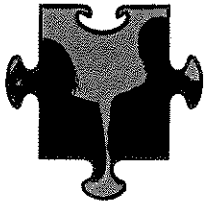
Escalante’s success was captured in the 1988 film _____ starring Edward James Olmos who received a Best Actor Oscar Nomination.

- a. $k^6(20k - 4)$ *Dangerous Minds*
- b. $4k^7(5 - k^{-1})$ *Lean on Me*
- c. $4k^6(5k - 1)$ *Stand and Deliver*

8. $18x^5 - 48x^4 + 56x^3 - 86x$

In 1987, its highest year, _____ students passed the AP Calculus exam.

- a. Prime 45
- b. $6x(3x^4 - 8x^3 + 7x^2 - 16)$ 65
- c. $2x(9x^4 - 24x^3 + 28x^2 - 43)$ 85



PERSON PUZZLE FACTORING BY GROUPING

NAME _____

DATE _____

SEPTIMA POINSETTE CLARK

Known as the "Queen Mother of the Civil Rights Movement", Septima Poinsette Clark (1898 – 1987) played key roles as an educator and activist for African Americans. Clark played key roles in developing literacy and citizenship workshops to help illiterate African Americans develop life skills and become educated, informed voters. Clark's work resulted in a series of awards including a *Living Legacy Award* in 1979.



DIRECTIONS: Factor each of the expressions by grouping. The word or phrase next to the equivalent answers will complete the statement correctly.

1. $d^2 - 7d + 5d - 35$

In 1898, Septima Poinsette Clark was born in Charleston, _____.

- a. $(d-7)(d+5)$ South Carolina
- b. $(d+7)(d-5)$ Virginia
- c. $(d-7)(d-5)$ West Virginia

3. $8ab - 8ac + 7b - 7c$

Clark graduated from high school in 1916, but couldn't attend college because of _____.

- a. $(8a+1)(7b-c)$ the distance from home
- b. $(8a+7)(b-c)$ finances
- c. $(8a-1)(7b+c)$ her race

5. $6x^2 + 4xz + 15xy + 10yz$

She taught children in the day and illiterate adults how to read at night. She had great success using a _____.

- a. $(6x+2y)(x+5z)$ Constitution
- b. $(3x+5y)(2x+2z)$ Phonebook
- c. $(2x+5y)(3x+2z)$ Sears catalog

7. $56fg - 35f + 16gh - 10h$

During summers Clark began studying in colleges and met _____. She became active in the NAACP and became a vice president.

- a. $(14f+2)(4g-5h)$ Malcolm X
- b. $(8f-2h)(7g+5)$ Martin Luther King
- c. $(7f+2h)(8g-5)$ W.E.B. Du Bois

2. $8p^3 - 64p^2 + p - 8$

As a young girl, Clark's mother refused for her to work in white houses because of _____.

- a. $(8p+1)(p+8)$ physical abuse
- b. $(8p^2-1)(p+8)$ psychological abuse
- c. $(8p^2+1)(p-8)$ sexual harassment

4. $10ab + 14a + 15b + 21$

Clark took her first teaching job in a rural school on _____.

- a. $(5a+3)(2b+7)$ Hilton Head Island
- b. $(2a+3)(5b+7)$ John's Island
- c. $(2a+7)(5b+3)$ Kiawah Island

6. $24x^3 - 64x^2 - 21x + 56$

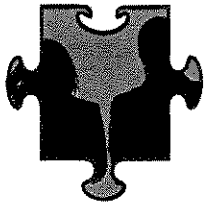
Citing drastic differences between her school and the white school across the street, Clark fought for _____ for teachers.

- a. $(6x^2-8)(4x-7)$ class-size limits
- b. $(8x^2-7)(3x-8)$ pay equalization
- c. $(3x^2-4)(8x-14)$ similar scheduling

8. $105m^3 - 224mn^2 - 180m^2n + 384n^3$

Clark refused to leave the NAACP and was fired from her job of 40 years. She then became known for establishing _____ Schools to teach reading to adults in the Deep South.

- a. $(7m-12n)(15m^2-32n^2)$ Citizenship
- b. $(21m-24n)(5m^2+16n^2)$ Liberty
- c. $(35m-48n)(3m^2-8n^2)$ Literacy



PERSON PUZZLE

FACTORING $x^2 \pm bx \pm c$

NAME _____

DATE _____

MOTHER TERESA

During her lifetime, Mother Teresa (1910 – 1997) dedicated much of her time, energy and compassion to serving the poor, sick and needy of the world. After founding the Missionaries of Charity, she guided service in India followed by expansion to other countries. It has been said about her that her life-long devotion to the care of the poor, the sick and the disadvantaged was one of the highest examples of service to humanity.



DIRECTIONS: Factor each expression. The word or phrase next to the equivalent expression will complete the statement correctly.

1. $x^2 + 5x + 4$

Although her family was Albanian, Mother Teresa was born and raised in Skopje, _____.

- a. $(x+3)(x+2)$ Kosovo
- b. $(x+4)(x+1)$ Macedonia
- c. $(x-4)(x-1)$ Montenegro

2. $m^2 - 2m - 3$

Her birth name was _____ Gonxha Bojaxhiu.

- a. $(m-3)(m+1)$ Agnes
- b. $(m+3)(m+1)$ Dranfile
- c. $(m+3)(m-1)$ Teresa

3. $p^2 - 12p + 32$

She left home at age 18 to join the Catholic organization Sisters of Loretto as a _____.

- a. $(p-2)(p-16)$ caregiver
- b. $(p-8)(p-4)$ missionary
- c. $(p+8)(p+4)$ teacher

4. $y^2 - 5y - 24$

She taught at a school in India called _____, a schoolhouse close to her convent.

- a. $(y-3)(y+8)$ Darjeeling Academy
- b. $(y-6)(y+4)$ Mumbai Secondary
- c. $(y-8)(y+3)$ St. Teresa's School

5. $v^2 + 19v + 60$

She was fluent in five languages: Bengali, Albanian, Serbo-Croatian, English and _____.

- a. $(v+4)(v+15)$ Hindi
- b. $(v+5)(v+12)$ Italian
- c. $(v+6)(v+10)$ Russian

6. $x^2 - 1$

She founded Missionaries of Charity who ministered to the poor, sick and _____.

- a. $x(x-1)$ criminal
- b. $(x-1)(x-1)$ falsely accused
- c. $(x+1)(x-1)$ orphaned

7. $k^2 - 19k + 78$

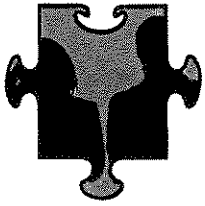
One among many honors given to her, she won the _____ in 1979.

- a. $(k-6)(k-13)$ Nobel Peace Prize
- b. $(k-2)(k-39)$ Person of the Year
- c. $(k-3)(k-26)$ Purple Heart

8. $x^2 + 7x - 120$

She placed in the top ten _____ times in the yearly Gallup's Most Admired poll.

- a. $(x-15)(x+8)$ 14
- b. $(x+12)(x-10)$ 16
- c. $(x+15)(x-8)$ 18



PERSON PUZZLE

FACTORING $AX^2 + BX + C$

NAME _____ DATE _____

MUHAMMAD YUNUS

Believing that access to credit is a human right, Muhammad Yunus (1940 –) developed a banking system to serve those in poverty. Faced with the reality that those in poverty did not have access to a traditional loan, Yunus began making small personal loans in an effort to change lives. Replicas of his bank have impacted the lives of millions of people.



DIRECTIONS: Factor each trinomial completely. The word or phrase next to the equivalent expression will complete the statement correctly. If it cannot be factored, the answer is “not factorable”.

1. $2x^2 + 11x + 5$
Muhammad Yunus was born in Chittagong, _____.
a. $(x+5)(2x+1)$ Bangladesh
b. $(2x+5)(x+1)$ India
c. $(2x-5)(x-1)$ Saudi Arabia
2. $3d^2 - 4d - 7$
Yunus was offered a Fulbright Scholarship and earned a Ph.D. in economics at _____.
a. $(3d+1)(d-7)$ Belmont College
b. $(d-1)(3d+7)$ Loyola University
c. $(d+1)(3d-7)$ Vanderbilt University
3. $6w^2 - 7w - 3$
He returned to Bangladesh and discovered the power of making small loans he called _____.
a. $(3w-1)(2w+3)$ bridge loans
b. $(3w+1)(2w-3)$ microcredit
c. not factorable miniloans
4. $4b^2 - 14b - 30$
In 1983, Yunus developed his small loan concept into a pilot program, the _____ Bank.
a. $(2b+6)(2b-5)$ Chittagong
b. $(4b-2)(b+15)$ Dhaka
c. $2(2b+3)(b-5)$ Grameen
5. $12y^2 - 11y - 15$
Statistics show that _____ of the loans are given to women.
a. $(2y-5)(6y+3)$ 65%
b. $(2y-3)(6y+5)$ 79%
c. $(3y-5)(4y+3)$ 94%
6. $2x^2 + 5x + 4$
In _____, Yunus and his program was awarded a Nobel Peace Prize.
a. $(2x+2)(2x-2)$ 1992
b. $(2x-4)(2x-1)$ 1998
c. not factorable 2006
7. $12n^2 + 48n + 60$
The author of a number of books, he wrote his bestseller _____ in 2003.
a. $12(n^2+4n+5)$ *Banker to the Poor*
b. $12(n+1)(n+5)$ *Lend a Hand*
c. $12(n-1)(n-5)$ *Loaning a Fishing Pole*
8. $6x^2 - 2x - 8$
In 2011, the Bangladeshi government fired Yunus from his bank falsely citing legal violations and a(n) _____ on his position.
a. $2(x+1)(3x-4)$ age limit
b. $2(3x+1)(x-4)$ attendance requirement
c. not factorable term limit