

March 4, 2019, Monday

sub work

March 5, 2019, Tuesday

1 Determine if the sequence is geometric. If it is, find the common ratio.

1) 4, 16, 64, 256, ... $r = \frac{16}{4} = 4$ YES $r = \frac{64}{16} = 4$

2) 2, 5, 10, 17, ... $r = \frac{5}{2} = 2.5$ NO $r = \frac{10}{5} = 2$

Find the three terms in the sequence after the last one given.

3) $-2, -6, -18, -54, -162, -486, -1458$ $r = \frac{3}{-2} = -1.5$

4) 3, 9, 27, 81, ... $r = \frac{9}{3} = 3$

Find the recursive formula.

5) $-2, -4, -8, -16, \dots$ $r = \frac{-4}{-2} = 2$ $a_n = -2(a_{n-1})$

Find the explicit formula.

6) $-1, -2, -4, -8, \dots$ $r = 2$ $a_n = -1(2)^{n-1}$

...test

Feb 28-8:11 AM

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Geometric Sequence $a_n = a_1 r^{n-1}$

Recursive: $a_n = r(a_{n-1})$

Explicit: $a_n = a_1 \cdot r^{n-1}$

Unit 4 Test Review

1) Write an explicit rule and find a_5 .

2) Consider the sequence 2, 6, 18, 54, ...

3) Given that a sequence is geometric, $a_4 = 98415$, and the common ratio is 3, find a_1 .

4) Graph the function $f(x) = 2(3)^x - 5$.

For each of the functions, identify the domain, range, x-intercept, y-intercept, growth or decay, end behavior, and rate of change over $[1, 2]$.

Describe the transformations made to $f(x) = 3^x$ to draw the following functions.

a) $g(x) = 2(3)^{x+5} - 1$

b) $h(x) = -3(3)^{-x}$

Exponential Equation $y = ab^{cx+d} + k$

1/4: steepness

-2: right 2

5: up 5

1: reflection

2: steepness

+1: left 1

Slope Formula $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{0.5 - 4}{2 - 1} = -3.5$

7) Write an equation for the given description:

Exponential that has a horizontal asymptote at $y = 2$ and up by 1.

Exponential Equation $y = 3(4)^{x-7} + 1$

8) Given the equation $y = 650(1.075)^x + 1$

a) Does the equation represent growth or decay?

b) What is the growth factor?

c) What is the rate of growth?

d) What is the initial value?

e) Evaluate for $x = 9$

9) Write an explicit formula and recursive formula to model the number of dots per day.

Geometric Sequence: $a_n = a_1 r^{n-1}$

Recursive: $a_n = r(a_{n-1})$

Explicit: $a_n = a_1 \cdot r^{n-1}$

How many dots will there be on day 7?

10) Taylor is training for a marathon. He decides to begin by running 3 miles and increase by 1.5 miles each day. Write an equation to represent the scenario. How long will it take him to run 34 miles?

Explicit: $a_n = a_1 \cdot r^{n-1}$

$a_1 = 3, r = 1.5$

$3 = 3(1.5)^{n-1}$

$1 = 1.5^{n-1}$

$n = 4$ days

$3(1.5)^4 = 22.8$

$3(1.5)^5 = 34.17$

11) You bought a Boston White in 2004 for \$12,500. The boat's value depreciates by 7% each year. How much is the boat worth in 2019?

Compound Interest $A = P(1+r)^t$

$t = 2019 - 2004 = 15$ $A = 12500(1-0.07)^{15} = 4208$ $A = 3914$

12) The population of a large city increases by a rate of 3% a year. When the 2000 census was taken, the population was 1.2 million.

a) Write a model for this population growth.

Compound Interest $A = P(1+r)^t$

$A = 1.2(1+0.03)^t$

b) What should the population be in 2019? What is the projected population for 2020?

$t = 2019 - 2000 = 19$ $A = 1.2(1+0.03)^{19} = 2.1$ million

$t = 2020 - 2000 = 20$ $A = 1.2(1+0.03)^{20} = 2.2$ million

13) Which function represents the sequence?

C. $3(6)^{n-1}$ D. $6(3)^{n-1}$

14) Which function shows the function $f(x) = 3^x$ being translated 3 units to the left?

A. $f(x) = 3^x - 3$ B. $f(x) = 3^{x+3}$ C. $f(x) = 3^{x-3}$ D. $f(x) = 3^x + 3$

15) The table represents an exponential function. Write the equation that represents the function.

x	1	2	3	4
y	12	48	192	768

Exponential Equation $y = ab^x$

$y = 3 \cdot 4^x$

16) True or False: An exponential function will always have a y-intercept.

17) True or False: An exponential function will always have a y-intercept.

18) Is the graph of the following function increasing or decreasing? $f(x) = 5^x$

19) The table below describes an exponential function.

x	0	1	2	3
y	8	32	16	8

b) Write the equation of the function.

Exponential Equation $y = ab^{cx+d} + k$

$y = 8(0.5)^x$

20) An item is purchased for \$4000 and depreciated in value 10% per year. Write an equation to describe the value of the item in years.

Compound Interest Formula $A = P(1+r)^t$

$A = 4000(1-0.10)^t$

21) Given the function $y = 3(2)^{x-4} - 4$

a) Does the function represent growth or decay?

b) What is the equation of the asymptote?

c) Describe the transformations that occur.

22) Given the function $y = 2(3)^{x-5} + 3$

a) Does the function represent growth or decay?

b) What is the equation of the asymptote?

c) Describe the transformations that occur.

March 6, 2019, Wednesday

6th & 11th term
The table shows a given sequence. If the pattern continues, find the 6th term of the sequence. NGSES-12.F.BF.2

Term Number	1	2	3	4	5	6
Sequence	2	4	8	16	32	64

$r = \frac{4}{2} = 2$

The function $f(x) = 2^x + 1$ is modeled on the graph below. Use the graph to answer questions NGSES-12.F.BF.2

7) What is the domain of the function? NGSES-12.F.BF.4

a) $(-\infty, \infty)$ \mathbb{R}
 b) $(0, \infty)$
 c) $(1, \infty)$
 d) $(-\infty, 1)$

8) Use the graph above to fill in the blank. NGSES-12.F.BF.4
 End behavior: As $x \rightarrow \infty$, $y \rightarrow$...test

a) $-\infty$
 b) ∞
 c) 0
 d) 1

Feb 28-8:11 AM

You can skip any TWO of the multiple choice questions. Please write "SKIP" largely!

Mar 6-10:36 AM

YouTube Search

Factoring The Basics

<https://www.youtube.com/watch?v=-VKAYzRp4o>

Copy 3 of the problems, to turn in.

Answer the question, what is factoring?

Mar 6-8:28 AM

March 7, 2019, Thursday

1) Samir made a pattern shown below. What number belongs in the position indicated by the question mark? NGSES-12.F.BF.2
 $9, 3, \frac{1}{3}, 7, \frac{1}{27}, \dots$

10) Which table **best** describes a function with exponential decay? NGSES-12.F.BF.4

a)

x	f(x)
1	81
2	27
3	9
4	3

 b)

x	f(x)
1	80
2	70
3	60
4	50

c)

x	f(x)
1	80
2	76
3	72
4	68

 d)

x	f(x)
1	2
2	4
3	8
4	16

21) Given the function $y = 2\left(\frac{1}{3}\right)^{x+1} - 5$,
(circle one)
 a) Does the function represent an exponential growth or exponential decay?
 b) What is the equation of the asymptote?
 $y =$ _____

Feb 28-8:13 AM

GSE Algebra I Unit 3A - Factoring Quadratics

Name: _____ Date: _____

GCF Factoring

Introduction to Factoring out GCF

*"Factor" simply means to **UNDISTRIBUTE**.*

Distributed Version	Factored Version
	$5x(x + 3)$
	$2x^2(x - 4)$
$2x^2 - 4x$	
$15x^2 - 5x + 30$	

More formal Definition:
 ● **Factoring:** Writing the polynomial as a product.

Steps to Factoring Out a GCF:

- Find the GCF of all its terms (number and/or variables). For variables ALL the terms must have the variable. Choose the **greatest** exponent!
- The GCF goes to the LEFT!
- Write the polynomial as a product by **dividing** the original terms of the polynomial by the GCF.
- The remaining factors in each term will form a polynomial. You'll always have the same number of terms you started with.

Factor using a GCF:

● $4x - 6y$ ● $6x^2 - 9x^2 + 12x$ ● $y^2 - y^2 + y^2$

Feb 28-9:04 AM

GSE Algebra I Unit 3A - Factoring Quadratics

FRACISE: Factor each polynomial using a GCF.

- $10x + 45$
- $28x - 63$
- $18a + 42$
- $6x + 24$
- $18x^2 - 15x + 39$
- $27a^2 + 81$
- $7a^3 + 33a^2 - 42a^2$
- $15x^2 + 30x - 45x^2$
- $4x^2 + 16x - 44$
- $10.14x^2 + 7x - 42$

Feb 28-9:04 AM

Name _____ Date _____

-Factoring the difference of two squares Notes-

What is the difference of two squares?

- Must have _____ squares
- Must have _____ (difference)
- A _____ is a _____ square if the _____ is an _____ number.

$4x^2 - 81$ and $x^2 - 16$

Examples:

1. $x^2 - 16$	2. $x^2 - 100$
3. $4x^2 - 25$	4. $9 - y^2$
5. $2x^2 - 8$	

Extra Practice:

1) $9x^2 - 1$	2) $4n^2 - 49$
3) $36k^2 - 1$	4) $p^2 - 36$
5) $2x^2 - 18$	6) $196n^2 - 144$

Mar 1-8:44 AM

GSE Algebra I Name _____ Date _____

Difference of Two Perfect Squares ($a^2 - b^2$)

1. $n^2 - 25$	2. $4x^2 - 121y^2$
3. $196r^2 - 1$	4. $100x^2 - 49$
5. $2x^2 - 162x$	6. $16x^2 - 36$
7. $8x^2 - 18$	8. $15x^2 - 60y^2$
9. $68x^2 - 17$	10. $25x^2 - 49y^2$
11. $50x^4 - 98x^2y^2$	12. $45x^2 - 20y^2$

Mar 1-8:46 AM

March 8, 2019, Friday

Factor the common factor out of each expression, if possible.

1) $-5y^3 - 10y^2 - 20$ 2) $9x^3 + 9x + 12$

3) $4x^3 + 3x^2 + 5$

Feb 28-8:13 AM

Intro to Factoring Quadratics Name _____

- Find two numbers that sum to 8 and have a product of 12 _____
- Find two numbers that sum to 5 and have a product of 6 _____
- Find two numbers that sum to 5 and have a product of -14 _____
- Find two numbers that sum to -8 and have a product of 12 _____
- Find two numbers that sum to 16 and have a product of 15 _____
- Find two numbers that sum to -4 and have a product of -21 _____
- Find two numbers that sum to 1 and have a product of -56 _____
- Find two numbers that sum to -14 and have a product of 40 _____
- Find two numbers that sum to 0 and have a product of -25 _____
- Find two numbers that sum to 8 and have a product of 16 _____

11. Multiply the following:

a. $(x + 6)(x + 3)$ b. $(x + 7)(x - 2)$

$x^2 + \underline{\quad}x + \underline{\quad}$

Notice: What is the sum of the constants in each binomial above?

$x^2 + \underline{\quad}x + \underline{\quad}$

Notice: What is the product of the constants in each binomial above?

$x^2 + \underline{\quad}x + \underline{\quad}$

Notice: What is the sum of the constants in each binomial above?

$x^2 + \underline{\quad}x + \underline{\quad}$

Notice: What is the product of the constants in each binomial above?

Feb 28-9:09 AM

Unit 3a Day 2 Notes - Factoring Trinomials when $a=1$

MCC9-12.A.1.1.3a-1 can factor a quadratic expression to reveal the zeroes of the function it defines.

Now let's factor binomials (3 terms)

- Remember, we undo multiplying!

Example 1: $x^2 + 5x + 6$

1. Is there a GCF? Yes or No

To factor a binomial, it breaks down into a product of binomials (2 terms each)

What are the factors of 6 (what pairs multiply to 6)? Which pair adds to be 5?

Answer: $(x + \underline{\quad})(x + \underline{\quad})$

Now you try!

1. $x^2 + 7x + 12$	2. $x^2 + 12x + 20$
3. $x^2 + 8x + 12$	4. $x^2 + 6x + 9$
5. $x^2 - x - 12$	6. $x^2 - 2x - 24$
7. $x^2 - 6x + 8$	8. $x^2 - 11x + 24$

Feb 28-9:10 AM

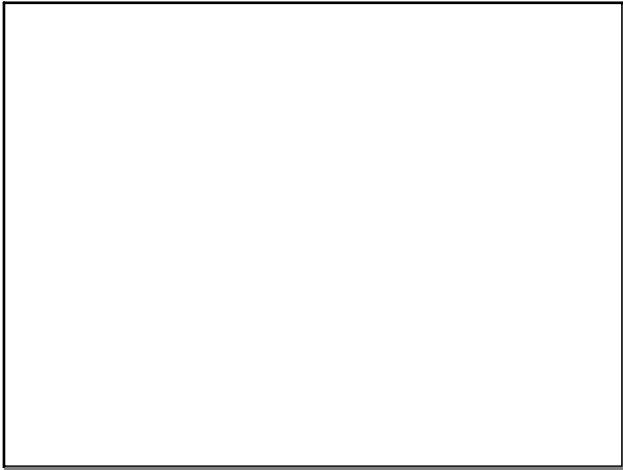
GSE Algebra I Unit 3A - Factoring Quadratics Name _____ Date _____

Factoring Trinomials ($ax^2 + bx + c$)

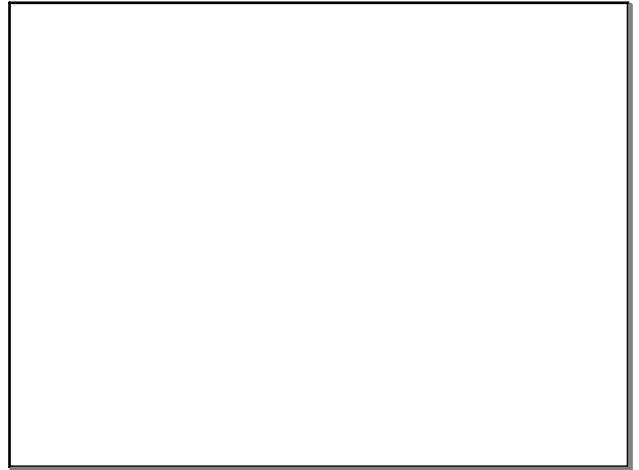
Factor each binomial completely. *Hint - #8-10 take out a GCF 1st!

1. $x^2 - 5x - 14$	2. $x^2 - 2x - 24$
3. $x^2 + x - 20$	4. $x^2 - 5x - 66$
5. $x^2 - 10x - 24$	6. $x^2 + 7x - 18$
7. $x^2 - 6x - 16$	8. $2x^2 + 12x^2 + 18x$
9. $3x^2 + 12x - 63$	10. $2x^3 - 6x^2 - 20x$

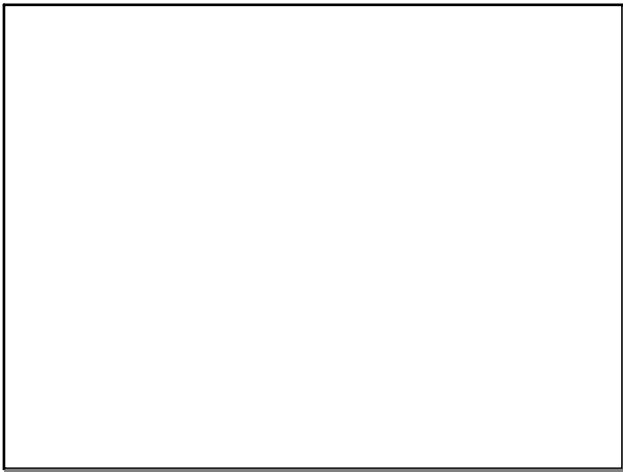
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Feb 28-8:44 AM



Feb 28-8:46 AM



Feb 28-9:26 AM

GSE Algebra 1 Name _____

Compare/Contrast: Linear, Quadratic, and Exponential Functions Notes

Attribute	Linear Functions	Quadratic Functions	Exponential Functions
Rate of change			
Domain & Range			
Intercepts			
Asymptotes			
End Behavior			

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Examples

Attribute	Linear Functions	Quadratic Functions	Exponential Functions
Rate of change			
Domain & Range			
Intercepts			
Asymptotes			
End Behavior			

Functions to Graph and Discuss:

$f(x) = 2x + 3$

$f(x) = 2x^2 + 3$

$f(x) = 2^x + 3$

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4. The graph represents a quadratic function.

a. Extrema: _____ b. Axis of Sym: _____

c. Zero: _____ d. y-intercept: _____

e. Domain: _____ f. Range: _____

g. Increasing: _____ h. Decreasing: _____

5. The quadratic function $f(x)$ has these characteristics:

- The vertex is located at $(6, -2)$.
- The range is $-2 < f(x) < \infty$.

Which graph could be $f(x)$?

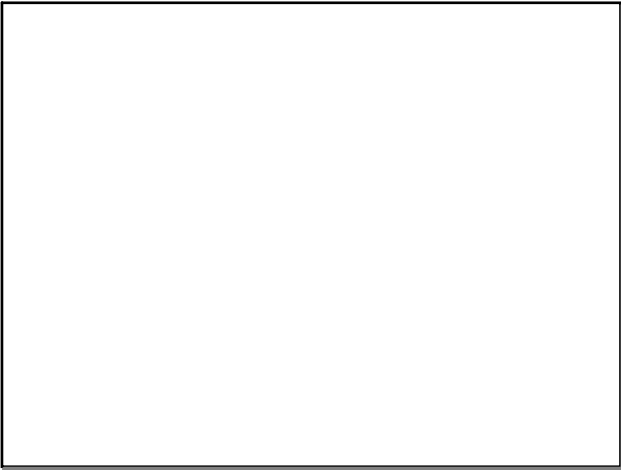
a) b)

c) d)

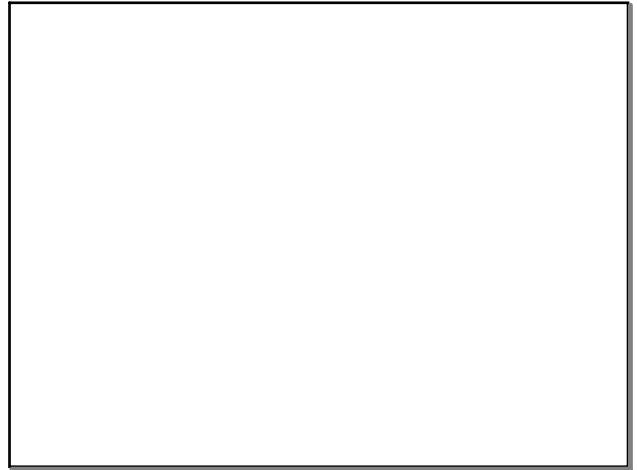
6. Use the information for a given quadratic function to sketch a picture of the function.

Domain: $-> x < \infty$
 Range: $y > -2$
 Increasing: $-1 < x < 1$
 Decreasing: $-> x < -1$
 There is no stretch or shrink ($a = 1$)

Feb 28-8:49 AM



Feb 28-9:11 AM



Feb 28-8:50 AM