4/8/20: Topic 1 SAS 1 and SAS 2 #1

4/9/20: Topic 1 SAS 2 #'s 2 – 5 and SAS 3

4/10/20: Topic 2 SAS 2

4/13/20: Topic 2 SAS 4

4/14/20: Topic 3 SAS 2

4/15/20: Topic 3 SAS 3 and SAS 4

4/16/20: Topic 4 SAS 1 and SAS 2

4/17/20: Topic 4 SAS 4 and Topic 5 SAS 4

4/20/20: Topic 6 SAS 2 #'s 1 - 5

4/21/20: Topic 6 SAS 2 #6 and SAS 3

4/22/20: Topic 6 SAS 4

4/23/20: Topic 6 SAS 5

4/24/20: Topic 7 SAS 1

Support for students, parents, and guardians:

- Teachers will be available to answer questions through Zoom on the following dates. To access the support call, follow the directions below:

    o **April 14th, 12:00 p.m. – 12:45 p.m.**
        - Click on the link: https://zoom.us/j/3791568353
        - Open Zoom app, click join, and enter Meeting ID: 379 156 8353

    o **April 21st, 12:00 p.m. – 12:45 p.m.**
        - Click on the link: https://zoom.us/j/3791568353
        - Open Zoom app, click join, and enter Meeting ID: 379 156 8353

Topic 1: Arithmetic and geometric sequences and series

1. **REVIEW** What are some key characteristics of linear, quadratic, and exponential functions? When considering each function, consider their respective graphical characteristics and the specific characteristics of the equations that describe each function.

2. **REINFORCE** Capture your understanding of arithmetic and geometric sequences by completing this table. State the ideas in your own words and provide your own examples, but also try to incorporate mathematical terms like **common difference** and **common ratio.**

Vocabulary term	What the term means	An example
Arithmetic sequence		
Geometric sequence		

Topic 1: Arithmetic and geometric sequences and series

3. **REINFORCE** Identify each pattern as an arithmetic sequence, geometric sequence, or neither type of sequence. Identify the common difference and common ratio, when necessary.

a. 10, 18, 26, 34, …

b. $\frac{1}{2}, \frac{1}{3}, \frac{2}{9}, \frac{4}{27}, …$

c. 5, 25, 125, 625, …

d. 6, 15, 45, 157.5, …

e. 4, 3.98, 3.96, 3.94, …

Topic 1: Arithmetic and geometric sequences and series
Student Activity Sheet 2: *Exploring* "Arithmetic sequences and series"

1. **REINFORCE** Find the first four terms of a sequence using the recursive definition.

a. $f(1) = 4$
$f(n) = f(n - 1) + 2$
for integer values of $n > 1$

b. $f(1) = 10$
$f(n) = f(n - 1) - 2.5$
for integer values of $n > 1$

c. $f(1) = 9$
$f(n) = 2f(n - 1)$
for integer values of $n > 1$

d. $f(1) = 2$
$f(n) = -4f(n - 2)$
for integer values of $n > 1$

e. $f(0) = -6$,
$f(1) = 3$
$f(n) = 2f(n - 1) + f(n - 2)$
for integer values of $n > 2$

Topic 1: Arithmetic and geometric sequences and series
Student Activity Sheet 2: *Exploring* "Arithmetic sequences and series"

2. **REINFORCE** Consider the sequence -8, -3 , 2 , 7, 12, 17…. Write a recursive definition and a general formula for this sequence.

3. **REINFORCE** Consider the sequence 8, 12, 18, 27, 40.5, 60.75…. Write a recursive definition and a general formula for this sequence.

4. **REINFORCE** Consider the sequence 30, 21, 12, 3, -6, -15…. Write a recursive definition and a general formula for this sequence.

5. **REINFORCE** Consider the sequence 64, 16, 4, 1, $\frac{1}{4}$, $\frac{1}{16}$…. Write a recursive definition and a general formula for this sequence.

Topic 1: Arithmetic and geometric sequences and series

Student Activity Sheet 3: *Exploring "Geometric sequences and series"*

1. REINFORCE Consider the following geometric series:

$$256 + 128 + 64 + 32 + 16 + 8 + 4$$

Using the formula, find the sum of the geometric series.

2. REINFORCE The drama club is performing a play where they will make $5000 on the first night. Each night after the first, their revenue will be 85% of the previous night's revenue.

a) Use this information to estimate the projected revenue for the first 5 nights of the production.

Night	1	2	3	4	5
Revenue	$5000				

b) Using the formula, determine the total amount of revenue the drama club will make for their first 15 performances.

3. REINFORCE Traveling carnivals move from town to town, staying for a limited number of days before moving to the next stop. The management of a certain carnival knows that, each time it opens in a new town, it can expect to bring in about $15,000 in revenue the first night. Each night after the first, revenue will be about 75% of the previous night's revenue. To the nearest dollar, about how much total revenue would the carnival expect after spending two weeks (14 days) in the town?

4. REINFORCE A bookstore chain sold 10,000 copies of a newly published novel in its first month on the shelves. Historically, sales of new novels fall by 20% each month. Which of the following could be used to determine the number of books sold in the first 6 months?

A. $S_6 = 10,000 \left(\dfrac{1 - (0.2)^6}{1 - (0.2)} \right)$

B. $S_6 = 10,000 \left(\dfrac{1 - (0.8)^6}{1 - (0.8)} \right)$

C. $S_{24} = 10,000 \left(\dfrac{1 - (0.8)^{24}}{1 - (0.8)} \right)$

D. $S_{24} = 10,000 \left(\dfrac{1 - (0.2)^{24}}{1 - (0.2)} \right)$

E. $S_6 = 10,000 \left(\dfrac{1 - (0.8)^6}{1 - (0.2)} \right)$

Topic 2: Understanding inverse relations

Student Activity Sheet 2: *Exploring "The inverse of a linear function"*

1. REINFORCE The CBA Credit Union offers a cash-back checking account that rewards a member with a $0.07 deposit to a linked savings account every time the member uses the CBA debit card to make a purchase. New members also receive a $4 cash-back reward bonus when they set up these accounts.

Suppose you become a member of this credit union and sign up for the cash-back checking account. Write a function that shows the relationship between the total number of debit card purchases you have made, *p*, and the total amount of cash-back rewards you have received, *c*.

2. REINFORCE Use the function rule from the previous question to determine your total cash-back rewards after making 30 debit card purchases.

3. REINFORCE Using the same function rule, how many debit card purchases would you have to make to earn a total of $40 in cash-back rewards?

4. REINFORCE Find the inverse function of $y = 3x - 15$.

5. REINFORCE Graph the inverse function of $f(x) = 4x + 2$.

Topic 2: Understanding inverse relations

6. **REINFORCE** For each of the following function rules, generate a table of data describing the function, *f*, and its inverse, *g*. Then, generate the rule for the inverse in two ways: directly from the data for the inverse and by algebraic manipulation of the original function rule. If necessary, show that your two inverse rules are equivalent.

a. $f(x) = 100 + 4x$

x	f(x)
-50	
-25	
0	
25	
50	

x	g(x)

b. $f(x) = -\dfrac{1}{4}x + 100$

x	f(x)
-100	
0	
100	
200	
300	
400	

x	g(x)

c. $f(x) = \dfrac{x+25}{5}$ (Choose your own set of *x*-values.)

x	f(x)	g(x)

Topic 2: Understanding inverse relations

7. **REINFORCE** Find the inverse function of $y = -3x + 8$.

8. **REINFORCE** Find the inverse function of $y = \dfrac{3}{5}x - 12$.

Topic 2: Understanding inverse relations

1. **REINFORCE** Could a quadratic function model the data in the table below? Justify your answer.

x	y
-2	5
-1	0
0	-1
1	2
2	9

2. **REINFORCE** Consider the function $f(x) = x^2 - 8$. Fill in the following tables to describe $f(x)$ and its inverse, $f^{-1}(x)$. Sketch a graph of $f(x)$ and $f^{-1}(x)$ on the same graph grid. Is the inverse relation a function? Explain.
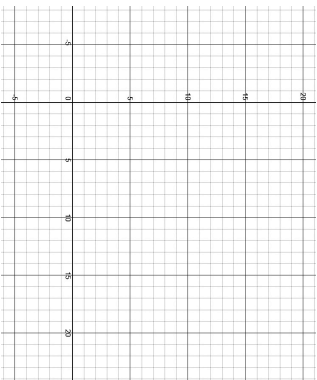
x
f(x)

x
f⁻¹(x)
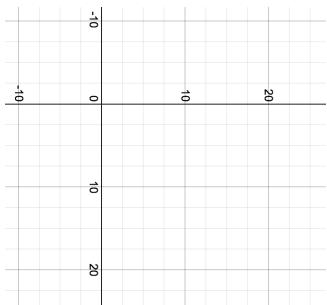
Topic 2: Understanding inverse relations

3. **REINFORCE** Consider the function $f(x) = -2x^2 + 18$. Fill in the following tables to describe $f(x)$ and its inverse, $f^{-1}(x)$. Sketch a graph of $f(x)$ and $f^{-1}(x)$ on the same graph grid. Is the inverse relation a function? Explain.

x
f(x)

x
f⁻¹(x)

4. **REINFORCE** Consider the function $f(x) = \sqrt{x - 4}$. Fill in the following tables to describe $f(x)$ and its inverse, $f^{-1}(x)$. Sketch a graph of $f(x)$ and $f^{-1}(x)$ on the same graph grid. Is the inverse relation a function? Explain.

x
f(x)

x
f⁻¹(x)
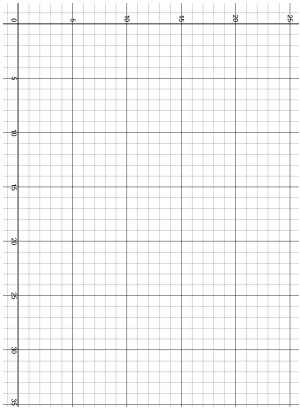
Topic 2: Understanding inverse relations

5. REINFORCE Restrict the domain of $f(x)$ to the largest possible set of values such that the inverse of f is a function. Find an algebraic rule for $f^{-1}(x)$, the inverse of f.

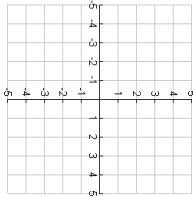a. $f(x) = 4x^2$

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

c. $f(x) = x^2 - 5$

6. REINFORCE Is the inverse of $y = x^4$ a function? Justify your answer.

Topic 3: Transforming functions
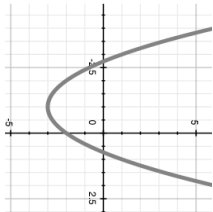Student Activity Sheet 2: *Exploring* "Transformations to fit data"

1. **REINFORCE** Graph the function $f(x) = (x - 4)^2$. How does this graph compare to the graph of the parent function $y = x^2$?
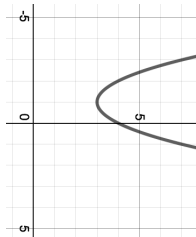

2. How do the parameters a, h, and k in the general equation $y = a(x - h)^2 + k$ affect the graph of a quadratic function?

3. **REINFORCE** For each graph, write the equation of the quadratic function in vertex form: $y = a(x - h)^2 + k$. Also describe the transformation from the parent function $y = x^2$.
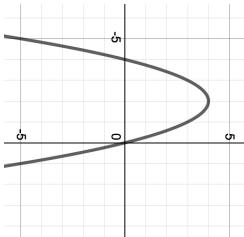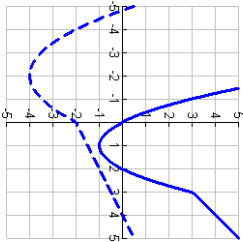
a.

Topic 3: Transforming functions
Student Activity Sheet 2: *Exploring* "Transformations to fit data"

b.

c.

Topic 3: Transforming functions
Student Activity Sheet 3: *Exploring* "Generalizing transformations"

1. **REINFORCE** The graph of the parent function rule *f*(*x*) (the solid blue line) has been transformed to create the graph of a new function rule *af*(*x* - *h*) + *k* (the dashed blue line). Using the answer choices provided, fill in the blanks to complete true statements about the values of *a*, *h*, and *k*.

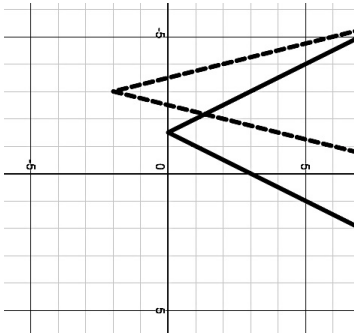| wider	narrower	*a* > 1	*a* is negative	0 < *a* < 1	|*a*| > 1
left	right	negative	positive	up	down

a: The transformed function graph is _____ than the original graph, so _____.

h: The transformed function graph is shifted to the _____, so *h* is _____.

k: The transformed function graph is shifted _____, so *k* is _____.

Topic 3: Transforming functions
Student Activity Sheet 3: *Exploring* "Generalizing transformations"

2. **REINFORCE** The graph of the parent function rule *g*(*x*), the solid line, has been transformed to create the graph of a new function rule *af*(*x* - *h*) + *k*, the dashed line. Using the answer choices provided, fill in the blanks to complete true statements about the values *a*, *h*, and *k*.

| wider	narrower	*a* > 1	*a* is negative	0 < *a* < 1	|*a*| > 1
left	right	negative	positive	up	down

a: The transformed function graph is _____ than the original graph, so _____.

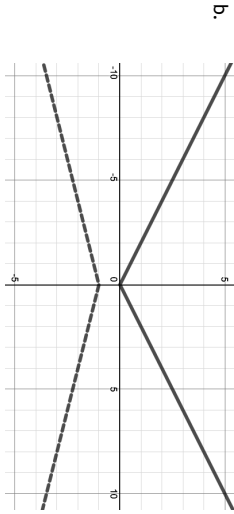*h*: The transformed function graph is shifted to the _____, so *h* is _____.

k: The transformed function graph is shifted _____, so *k* is _____.

3. **REINFORCE** What values of *a*, *h*, and *k* will transform the graph of the original function, *f*(*x*), shown with the solid line, so that it matches the graph of the new function rule *y* = *af*(*x* - *h*) + *k*, the dashed line?
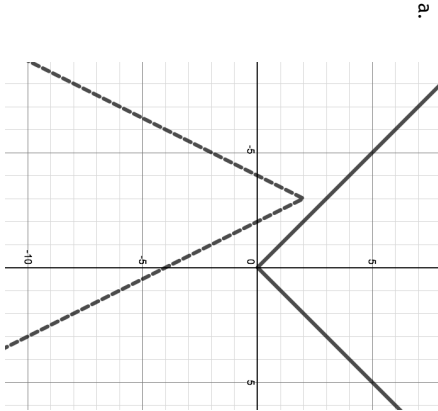
a.

b.

Topic 3: Transforming functions

1. **REINFORCE** Write $g(x)$ in terms of f.

	x	f(x)
A	-3	-12
B	-1	2
C	0	3
D	2	-7

	x	g(x)
A'	0	-8
B'	2	6
C'	3	7
D'	5	-3

2. **REINFORCE** How is the graph of $g(x)$ related to the graph of $f(x)$ if $g(x) = f(x + 7) - 3$?

Topic 3: Transforming functions

3. **REINFORCE** Given the following graph of the function $f(x)$, sketch and label the graphs of $g(x) = f(x - 4)$ and $h(x) = f(x + 3)$
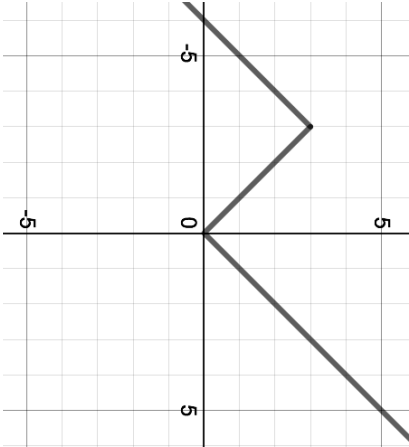
4. **REINFORCE** The function $h(x)$ is defined as $h(x) = \dfrac{1}{3}f(x - 2) + 4$. Describe the relationship between $h(x)$ and $f(x)$ in terms of horizontal and vertical shifts and vertical compressions or stretches.

Topic 4: Introduction to polynomial functions
Student Activity Sheet 1; *Overview*

1. **REVIEW** Simplify each expression.

a. $5x^2 + 4x - 2xy - 5x - 2x^2 + 4xy + y^2$

b. $x(7 - 3x) - 2(2x^2 + 3x) + 12$

c. $(x - 5)(x + 2)$

d. $(3x + 7)(2x - 3)$

Topic 4: Introduction to polynomial functions
Student Activity Sheet 2; *Exploring* "Building polynomials"

1. **REINFORCE** Find the indicated sum or difference.

a. $(x - 1) + (5x + 10) - (2 - 3x)$

b. $(x^3 - 4x^2 + 2x - 3) + (8 - 2x^2 + x)$

c. $(5x - 3x^2) - (4 - 2x^2)$

Topic 4: Introduction to polynomial functions
Student Activity Sheet 2: *Exploring* "Building polynomials"

2. **REINFORCE** Find the indicated products.

a. $(x + 4)(x - 3)$

b. $(x^2 - 9)(x - 2)$

c. $(x + 2)(x - 2)(x + 5)$

d. $(x + 1)(x - 3)(x + 2)$

Topic 4: Introduction to polynomial functions
Student Activity Sheet 2: *Exploring* "Building polynomials"

3. **REINFORCE** A rectangular cooler is 12 inches long, 9 inches wide, and 9 inches deep.

a. What is the volume of the cooler?

b. If each dimension is increased by x inches, what would be the new volume?

Topic 4: Introduction to polynomial functions

Student Activity Sheet 4: *Exploring* "Deepening your understanding of quadratics and cubics"

1. **REINFORCE** For the function $f(x) = x^2 + 2x + 4$, find the average rate of change for the intervals $1 \le x \le 3$ and $3 \le x \le 7$.

Topic 5: Analyzing polynomial functions

Student Activity Sheet 4: *Exploring* "Higher degree polynomials"

1. **REINFORCE** How many x-intercepts do the graphs of the following functions have? What are they?

a. $f(x) = x^3 + x$

b. $g(x) = (x + 1)(x - 1)^2$

c. $h(x) = x^3 + 27$

d. $j(x) = x^3 - 1$

Topic 6: Polynomial equations
Student Activity Sheet 2; *Exploring* "Quadratic equations"

1. REINFORCE A Roman candle firework is launched from a platform 8 feet above the ground. The firework has an initial velocity of 150 feet per second. A function that models the firework's vertical distance with respect to time, t, is

$$h(t) = -16t^2 + 150t + 8$$

Approximately when will the firework hit the ground?

2. REINFORCE The height of a tomato dropped from 32 feet above the ground is given by the function $h(t) = -16t^2 + 32$. How long will it take for the tomato to hit the ground?

3. REINFORCE Solve each of the following quadratic equations using factoring, when possible.

a. $4x^2 - 16x = -16$

b. $x^2 - 9 = 0$

Topic 6: Polynomial equations
Student Activity Sheet 2; *Exploring* "Quadratic equations"

c. $x^2 - 10x + 25 = 0$

d. $x^2 = 12x$

4. REVIEW Sketch three parabolas that illustrate the different possibilities for the x-intercepts of the graph of a quadratic function.

Topic 6: Polynomial equations
Student Activity Sheet 2; *Exploring* "Quadratic equations"

5. REVIEW Solve each of the following quadratic equations using the quadratic formula.

a. $2x^2 - 4x - 2 = 0$

b. $5x^2 - 2x - 9 = 0$

Topic 6: Polynomial equations
Student Activity Sheet 2; *Exploring* "Quadratic equations"

6. REINFORCE Solve each of the following quadratic equations, simplifying answers as much as possible. Classify the roots as two real roots, one real root, or two non-real complex roots. Then use your graphing calculator to compare each equation to the graph of its related function.

a. $2x^2 - 3x = -11$
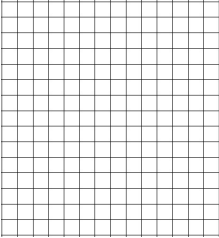
b. $3x^2 + 45 = 0$
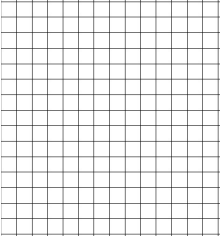
c. $-4x^2 = -3x + 15$
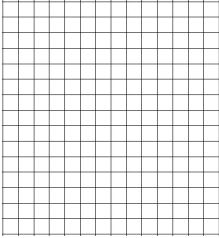
Topic 6: Polynomial equations
Student Activity Sheet 3: *Exploring* "Complex numbers"

1. **REVIEW** Rewrite each imaginary number in terms of *i*.

a. $\sqrt{-16}$

b. $\sqrt{-24}$

c. $\sqrt{-\frac{9}{25}}$

2. **REINFORCE** Calculate each power of *i*.

a. $i^8 =$ _____

b. $i^{66} =$ _____

c. $i^{33} =$ _____

3. **REINFORCE** Compute each of the following sums and differences.

a. $(3 + 4i) + (1 - 2i)$

b. $(-4 + 8i) - (2 + 18i)$

4. **REINFORCE** Compute each of the following products.

a. $(3 + 4i)(1 - 2i)$

b. $(-4 + 12i)(2 + 12i)$

Topic 6: Polynomial equations
Student Activity Sheet 4: *Exploring* "Other polynomial equations"

1. **REINFORCE** Rewrite each expression in factored form.

a. $5x^3 + 10x^2 + 15x + 30$

b. $x^3 + 3x^2 + 4x + 12$

c. $27x^3 + 64$

d. $x^6 - y^6$

e. $6x^4 - 28x^3 - 25x^2 + 70x + 25$

f. $4x^3 + 12x^2 - 25x - 75$

Topic 6: Polynomial equations
Student Activity Sheet 5; *Exploring* "Theorems of algebra"

1. REINFORCE Solve each of the cubic equations in question 1 over the complex numbers.

a. $x^3 + 4x^2 - 11x - 30 = 0$
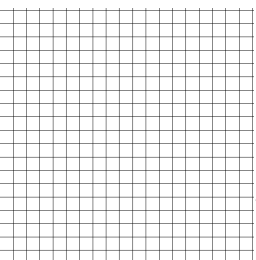
b. $x^3 + 4x^2 - 11x + 6 = 0$
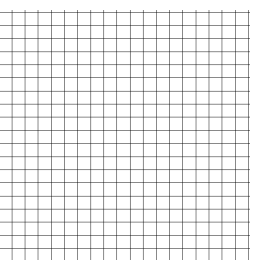
c. $x^3 + 4x^2 - 10x + 12 = 0$
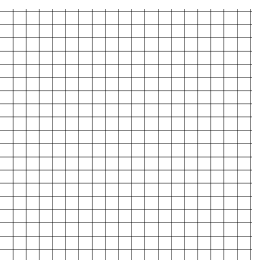
Topic 6: Polynomial equations
Student Activity Sheet 5; *Exploring* "Theorems of algebra"

2. For $p(x) = x^3 + 3x^2 - 6x - 8$, find the remainder upon division for the given factor and evaluate the function for the given point.

a. $\dfrac{p(x)}{x+1}$

b. $\dfrac{p(x)}{x-3}$

c. $\dfrac{p(x)}{x+4}$

Topic 6: Polynomial equations
Student Activity Sheet 5: *Exploring* "Theorems of algebra"

3. Using synthetic division, find the quotient of the following:

$$\frac{2x^4 + 3x^3 - 10x^2 - 9x + 12}{x - 3}$$

4. The cubic polynomial $2x^3 - x^2 - 25x - 12$ has one linear factor $(2x + 1)$. What are the other linear factors?

Topic 7: Exponents and radicals
Student Activity Sheet 1; *Overview*

1. **REINFORCE** Simplify each numerical expression using the laws of exponents. Leave your answers in exponential form.

a. $7^4 \cdot 7^5 = $ _____

b. $2^{-4} \cdot 3^6 \cdot 2^8 = $ _____

c. $\dfrac{a^9}{a^{-3}} = $ _____

d. $\dfrac{2b^3}{c^6} \cdot \left(\dfrac{2^2 b^{-4}}{c^2}\right)^{-2}$

e. $\dfrac{16a^4 b^{-5}}{c^2} \cdot \dfrac{a^7 b^3}{4c} = $ _____

f. $(3a^{-3}b^6)^4 = $ _____

Topic 7: Exponents and radicals
Student Activity Sheet 1; *Overview*

2. **REINFORCE** Create expressions that meet the conditions specified.

a. The expression simplifies to $4^2 x^4 y$ using the multiplication rule.

b. The expression simplifies to $\dfrac{5x^7}{y^3}$ using the division rule, and has at least one negative exponent.

c. The expression simplifies to $5^3 x^5 y^2$ using the multiplication rule and the power rule, and has at least two negative exponents.

4/8/20:

Topic 1 Student Activity Sheet 1

1. Linear
   a. Graph is a straight line
   b. Equation is $y = x$

   Quadratic
   a. Graph is a parabola
   b. Equation is $y = x^2$

   Exponential
   a. Graph increases rapidly from a small value as it moves to the right or decreases rapidly from a large value as it moves to the right
   b. There are many different examples of exponential equations. There must be a base value with a variable exponent: $y = 2^x$, $y = 3^x$, $y = \left(\frac{1}{2}\right)^x$, $y = \left(\frac{1}{4}\right)^x$, etc.

2.

Vocabulary term	What the term means	An example

Arithmetic sequence	• Sequence created by adding or subtracting a specific value to each term to create the next term
	 • The number that is added to each term to get the next term is called the common difference
		There are many examples of arithmetic sequences, just make sure the sequence follows a pattern of adding or subtracting the same value:
		 • 5, 7, 9, 11, 13
		   $d = 2$
		 • 9, 4, -1, -6, -11
		   $d = -5$
		 • 2, 12, 22, 32, 42
		   $d = 10$

Geometric sequence	• Sequence created by multiplying a specific value to each term to create the next term
	 • The number that is multiplied to each term to get the next term is called the common ratio
		There are many examples of geometric sequences, just make sure the sequence follows a pattern of multiplying by the same value:
		 • 5, 10, 20, 40, 80
		   $r = 2$
		 • 4, 2, 1, $\frac{1}{2}$, $\frac{1}{4}$
		   $r = \frac{1}{2}$

3. a. Arithmetic Sequence $d = 8$
   b. Geometric Sequence $r = \frac{2}{3}$
   c. Geometric Sequence $r = 5$
   d. Neither Arithmetic or Geometric
   e. Arithmetic Sequence $d = -0.02$

Topic 1 Student Activity Sheet 2 # 1

1. a. 4, 6, 8, 10
   b. 10, 7.5, 5, 2.5
   c. 9, 18, 36, 72
   d. 2, -8, 32, -128
   e. -6, 3, 0, 3

4/9/20:

Topic 1 Student Activity Sheet 2 #'s 2 – 5

2. Recursive: $f(n) = f(n - 1) + 5$ General Formula: $a_n = -8 + 5(n - 1)$

3. Recursive: $f(n) = 1.5f(n - 1)$ General Formula: $a_n = 8(1.5)^{n-1}$

4. Recursive: $f(n) = f(n - 1) - 9$ General Formula: $a_n = 30 - 9(n - 1)$

5. Recursive: $f(n) = \frac{1}{4}f(n - 1)$ General Formula: $a_n = 64\left(\frac{1}{4}\right)^{n-1}$

Topic 1 Student Activity Sheet 3

1. 508

2. a.

Night	1	2	3	4	5
Revenue	$5000	$4250	$3612.50	$3070.63	$2610.03

   b. $30,421.53

3. $58,930.92

4. B

4/10/20:
Topic 2 Student Activity Sheet 2

1. $c = .07p + 4$

2. $c = \$6.10$

3. $p = 515$

4. $y^{-1} = \frac{1}{3}x + 5$

5. $f^{-1}(x) = \frac{x-2}{4}$

6a.

X	F(x)	X	G(x)
-50	-100	-100	-50
-25	0	0	-25
0	100	100	0
25	200	200	25
50	300	300	50

6b.

X	F(x)	x	G(x)
-100	125	125	-100
0	100	100	0
100	75	75	100
200	50	50	200
300	25	25	300
400	0	0	400

6c.

X	F(X)	G(X)
0	5	-25
1	5.2	-20
2	5.4	-15
3	5.6	-10
4	5.8	-5

7. $y^{-1} = \frac{-x+8}{3}$

8. $y^{-1} = \frac{5}{3}x + 20$

4/13/20:
Topic 2 Student Activity Sheet 4

1. Yes, the second differences are constant.

2. $f^{-1}(x) = \sqrt{x+8}$

3.

X	F(x)	x	$f^{-1}(x)$
-2	14	14	-2
-1	16	16	-1
0	18	18	0
1	16	16	1
2	14	14	2

4.

X	F(x)	X	$f^{-1}(x)$
4	0	0	4
5	1	1	5
8	2	2	8
13	3	3	13
20	4	4	20
29	5	5	29

5. $f^{-1}(x) = \frac{\sqrt{x}}{2}$

6. $f^{-1}(x) = \sqrt{x-3}$

7. $f^{-1}(x) = \sqrt{x+5}$

8. No, $y = x^4$ is not a one-to-one function.

Algebra II
Answer Sheet

4/14/20:
Topic 3 Student Activity Sheet 2
1. Transforms 4 units to the right.

2. a: Vertical Stretch or compression
   h: Horizontal Shift
   k: Vertical Shift

3. a. 2 units left and 3 units down.
   b. 1 unit left and 3 units up.
   c. Reflects across the x-axis. Shifts 2 units left and 4 units up

4/15/20:
Topic 3 Student Activity Sheet 3
1. a: wider, $|a| > 1$
   h: Left, Positive
   k: Down, Negative

2. a: Skinnier, $0 < a < 1$
   h: Left, Positive
   k: Down, Negative

3. a. $y = |x + 3| + 2$
   b. $y = -|x| - 1$

Topic 3 Student Activity Sheet 4
1. $g(x) = f(x - 3) + 4$

2. Left 7 and down 3

3. $g(x) = f(x)$ shifted right 4 units
   $h(x) = f(x)$ shifted left 3 units

4. Vertical compression of $^1/_3$. Shifted right 2 units and up 4 units.

Algebra II
Answer Sheet

4/16/20:
Topic 4 Student Activity Sheet 1
1. $3x^2 - x + 2xy + y^2$

2. $-7x^2 + x + 12$

3. $x^2 - 3x - 10$

4. $6x^2 - 5x - 21$

Topic 4 Student Activity Sheet 2
1. a. $9x + 7$
   b. $x^3 - 6x^2 + 3x + 5$
   c. $-x^2 + 5x - 4$

2. a. $-x^2 + x - 12$
   b. $x^3 - 2x^2 - 9x + 18$
   c. $x^3 + 5x^2 - 4x - 20$
   d. $x^2 - 7x - 6$

3. a. $972 \ in^3$
   b. $x^3 + 30x^2 + 297x + 972 in^3$

4/17/20:
Topic 4 Student Activity Sheet 4
1. 6; 12

Topic 5 Student Activity Sheet 4
1. a. 1; $x = 0$
   b. 2; $x = -1, 1$
   c. 1; $x = 3$
   d. 1; $x = 1$

Algebra II
Answer Sheet

Topic 6 Student Activity Sheet 2 #'s 1 - 5

1. 9.43 secs

2. 1.41 secs

3. a. $x = 2$
   b. $x = -3, 3$
   c. $x = 5$
   d. $x = 0, 12$

4. graphs with: no x-intercepts, one x-intercept, and two x-intercepts

5. a. $x = 1 \pm \sqrt{2}$
   b. $x = \frac{1 \pm 2\sqrt{46}}{5}$

Topic 6 Student Activity Sheet 2 #'s 6

6. a. $x = \frac{3 \pm i\sqrt{79}}{4}$
   b. $x = \pm i\sqrt{15}$
   c. $x = \frac{3 \pm i\sqrt{231}}{8}$

Topic 6 Student Activity Sheet 3

1. a. $\pm 4i$
   b. $\pm 2i\sqrt{6}$
   c. $\pm \frac{3}{5}i$

2. a. 1
   b. -1
   c. i

3. a. $4 + 2i$
   b. $-6 - 10i$

4. a. $11 - 2i$
   b. $-152 - 24i$

Algebra II
Answer Sheet

Topic 6 Student Activity Sheet 4

1. a. $5(x^2 + 3)(x + 2)$
   b. $(x^2 + 4)(x + 3)$
   c. $(3x + 4)(9x^2 + 12x + 16)$
   d. $(x - y)(x^2 + xy + y^2)(x + y)(x^2 - xy + y^2)$
   e. $(x - 5)(2x^2 - 5)(3x + 1)$
   f. $(2x - 5)(2x + 5)(x + 3)$

Topic 6 Student Activity Sheet 5

1. a. $x = -5, -2, 3$
   b. $x = -6$ and 1 (1 is a solution twice)
   c. $x = -6,\ 1 + i,\ 1 - i$

2. a. remainder $= 0$
   b. remainder $= 28$
   c. remainder $= 0$

3. $2x^3 + 9x^2 + 17x + 42 + \frac{516}{x - 3}$

4. $(x-4)$ and $(x+3)$

Topic 7 Student Activity Sheet 1

1. a. 7^9
   b. $2^4 \cdot 3^6$
   c. a^{12}
   d. b^{11}
   e. $\frac{2^3 c^2}{4a^{11}}$
   e. $\frac{b^2 c^3}{3^4 b^{24}}$
   f. $\frac{3^4 b^{24}}{a^{12}}$

2. There are a lot of answers that can be correct, but here is one example for each:
   a. $(4x^3 y) \cdot 4x$
   b. $\frac{25x^3 y^5}{5x^4 y^8}$
   c. $(5^{-2} x^2 y^3)^{-2}(5^{-1} x^9 y^8)$