Secondary 1 Term 3

Text & Reference Manual

This booklet is to help bridge the gap between parents, students and teacher. We will go through some of it in-class, but it is the student's responsibility to complete.

Name: ______________________________

Teacher: ______________________________

Class Period: ______________________________

Key Policies for Secondary Math 1:

- Students must pass every Unit Test with an 80% or better in order to receive a passing grade. Otherwise, grade will be an "F" or an "I" as determined by the teacher.
- Student may retake any Unit Test as many times as necessary to show understanding of the essential standards in the core.
- Student should complete these study guides as part of the class requirement.
- Homework turned in after the due date will receive a penalty to credit unless excused by the teacher.
- Term finals may NOT be retaken for a higher score and must be completed in one sitting.
- Each term includes a final date when homework will no longer be accepted for credit.

Study Guide Grades	
Unit 7 **Parallel Lines & Angles** **Due January 11/12**	
Unit 8 Study Guide **Function Operations** **Due February 1/2**	
Unit 9 Study Guide **Sequences** **Due February 22/23**	

Please review the following policies for Secondary One:

- Students must pass every Unit Test with an 80% or better in order to receive a passing grade.
- Practice tests for each unit are **available online** to help prepare for the tests.
- Students may retake any unit test as many times as necessary to show understanding of the essential standards in the core.
- Any failing grade can be made up to a passing grade until the last week of term 4.
- Students may take missing tests after the end of any term as needed, but we encourage students to make up tests as soon as possible after the initial administration.
- A failing grade must be made within one term to earn a grade higher than a D-. Any grade made up after one term must be by contract with the teacher or student will have an F on their permanent record and will have to make up the credit online.
- Traditional textbooks are available upon request.
- Term finals may not be retaken for a higher score and must be completed in one sitting unless there are extenuating circumstances are presented before the test is administered.
- Homework turned in after the due date will receive a penalty to credit unless excused by the teacher because of absence or other extenuating circumstances.
- Each term includes a final date when homework will no longer be accepted for credit.
- If students damage a class-provided calculator (TI-84) a fee of $90 will be added to school fees and the student will no longer will have access to a school calculator.
- If students damage a class-provided iPad, a fee of $450 will be added to school fees and the student will no longer will have access to another calculator.
- Students should complete the study guides included in this packet as part of the homework requirement: These study guides provide information on each concept tested for the unit.

SECONDARY MATH 1 SCOPE AND SEQUENCE 2017-2018 (TERM THREE)
SUBJECT TO CHANGE

TERM 3: Jan 3 – Mar 9

UNIT 7—Parallel Lines with Angles					
Assn	**Learning Objective**	**A Day**	**B Day**	**Done**	**Core Std**
7A	Angle Relations	Dec 15	Dec 18		G.CO.1, & 12
		Dec 19	Dec 20 ($\frac{1}{2}$ day)		
7B	All About Lines	Jan 3	Jan 4		G.CO.2, G.GPE.5
7C	Constructing Angles	Jan 5	Jan 8		G.CO.12
7D	Parallel Lines	Jan 9	Jan 10		G.CO.12
7R	Unit 7 Review	Jan 11	Jan 12		
***NO SCHOOL Jan 15th					
	Unit 7 Parallel Lines Test	Jan 16	Jan 17		

Unit 8—Function Operations					
Assn	**Learning Objective**	**A Day**	**B Day**		**Core Std**
8A	Adding Functions	Jan 18	Jan 19		F.IF.1, 2, & 7
8B	More Adding	Jan 22	Jan 23		F.IF.1, 2, 4, 5, 7, & 9
8C	Multiplying Functions	Jan 24	Jan 25		F.IF.1, 2, 4, 5, 7, & 8
8D	Shifting	Jan 26	Jan 29		F.IF.2, F.IF.4, F.IF.5, F.IF.6
8R	Unit 8 Review	Jan 30	Jan 31		
	Unit 8 Function Operations Test	Feb 1	Feb 2		

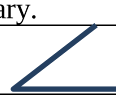
UNIT 9—Sequences					
Assn	**Learning Objective**	**A Day**	**B Day**		**Core Std**
9A	Arithmetic Sequences	Feb 5	Feb 6		F.IF.3, F.BF.1 & 2, F.LE.2,
9B	Geometric Sequences	Feb 7	Feb 8		F.IF.3, F.IF.6, F.BF.2, F.LE.3
9C	Arithmetic/Geometric and Linear/Exponential (Simple/Compound)	Feb 9	Feb 12		F.IF.3, F.IF.7, F.IF.9, F.BF.1, F.BF.2
9D	Growth and Decay	Feb 13	Feb 14		F.LE.1-3, F.LE.5
9E	More of everything	Feb 15	Feb 16		F.IF.3, F.IF.5, F.BF.1, F.BF.2
***NO SCHOOL Feb 19th					
9R	Sequence Review	Feb 20	Feb 21		
	Sequence Test	Feb 22	Feb 23		
	Term 3 Final Review Work Day	Feb 26	Feb 28		
	Term 3 Final	Mar 1	Mar 2		**DEAD DAY**
	**Professional Day ** March 6th				
	Remediate Day	Mar 6	Mar 7		

TERM 3 ENDS MARCH 9

ALL ASSIGNMENTS MUST BE TURNED IN BY MARCH 1ST (A-DAY) OR MARCH 2ND (B-DAY) TO RECEIVE CREDIT.

7SG Parallel Lines Study Guide

SHOW YOUR WORK FOR FULL CREDIT. NO WORK, NO CREDIT. NO WORK IN PEN.

Targets	**Sample**	Help	Not Bad	Master	Assn
Understand congruent angle relationships	Give an example of Alternate Interior Angles, Same Side Exterior and Corresponding Angles and state if congruent or supplementary.				
Copy an angle	Using only a compass and straight-edge, copy the following angle: 				
Construct Parallel Lines with Congruent Angles	Given a line segment and point, not on the line, construct a parallel line using a compass and straight edge				
Using angle relationships to find the measure of angles.	If angles *a* and *b* are corresponding and the measure of angle $a = 4 + 2p$ and $b = 8p - 14$, find *p* and the measure of *a* and *b*.				

Vocabulary

Parallel Lines: ____

Perpendicular Lines: ____

Right Angle:____

Transversal: ____

Interior: ____

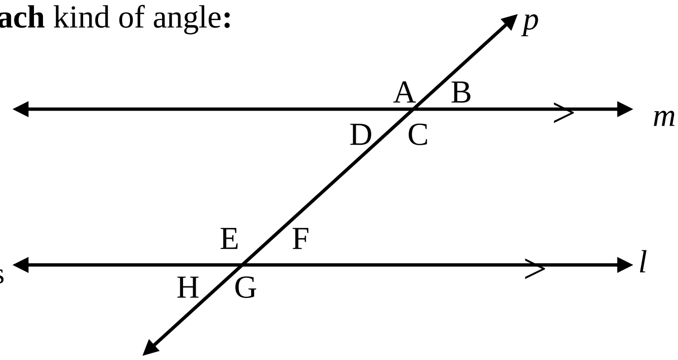
Exterior: ____

Adjacent: ____

Supplementary Angles: ____

Complementary Angles: ____

IF *l* || *m* in the following image, **give an example of each** kind of angle**:**



Vertical Angles: $\angle A$ & ________

Corresponding Angles: $\angle D$ & ________

Same-Side Interior Angles: $\angle C$ & ________

Same-Side Exterior Angles: $\angle H$ & ________

Alternate Interior Angles: $\angle D$ & ________

Alternate Exterior Angles: $\angle H$ & ________

$\angle A$ and $\angle G$ are ________________________ Angles

$\angle H$ and $\angle D$ are ________________________ Angles

$\angle D$ and $\angle E$ are ________________________ Angles

Finding angle measurements

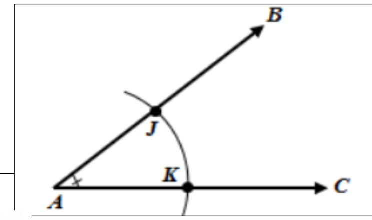
1. If lines *l* and *m* are parallel, $\angle A$ and $\angle E$ are______________________ angles and their measurements are ________________. If $\angle A = 3x + 20$ and $\angle E = 2x + 60$, find x. ___________

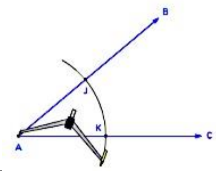
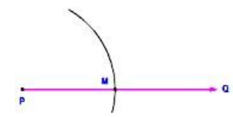
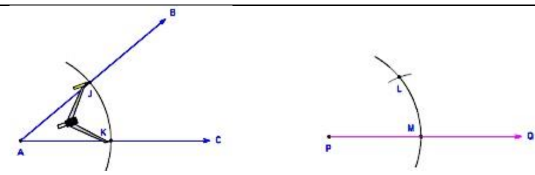
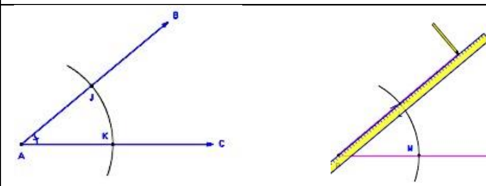
   What is the measure of $\angle A$? ___________ $\angle E$? ___________

2. If lines *l* and *m* are parallel, $\angle H$ and $\angle B$ are ________________ exterior angles and their measurements are ________________. If $\angle H = x + 40$ and $\angle B = -2x + 25$, find x. ___________

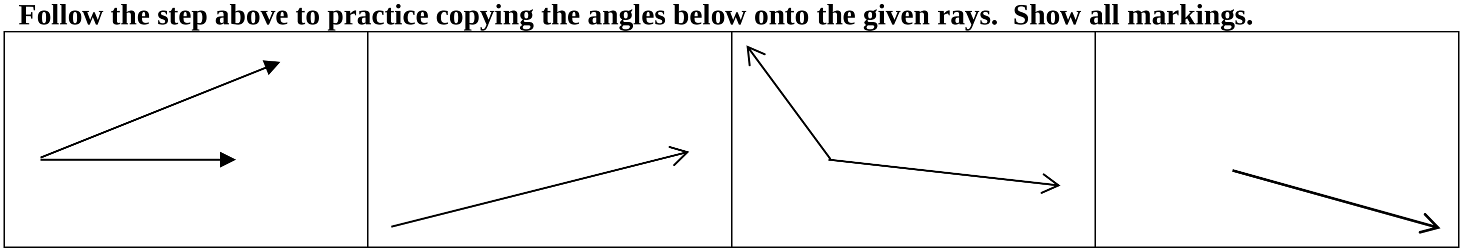
   What is the measure of $\angle H$? ___________ $\angle B$? ___________

Copy an Angle: Instructions on how to copy angle BAC
You can see a live animation at: http://www.mathopenref.com/constcopyangle.html

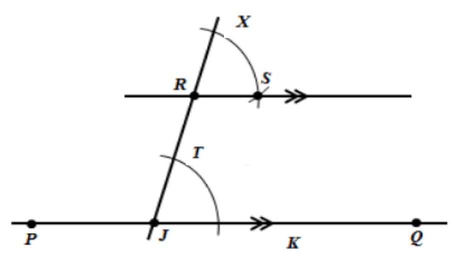


Step 1: Make a point P to be the vertex of the new _____________. Step 2: From P, draw a ray PQ. This will become one __________ of the new angle.	
Step 3: Place the compass on point A and set it to any _____________. Step 4: Draw an ____ across both sides of the angle—mark the points J and K as shown. $\overline{AJ}$ and $\overline{AK}$ are ____________ of the same circle.	
Step 5: Without changing the width of the ____________, place its point on P and draw a congruent ______, creating point M as shown right.	
Step 6: Measure the _______________ from K to J. Step 7: Without changing the compass width, measure the same distance from point M across the _____. (The third side of congruent triangles.)	
Step 8: Draw a ray from P through L—exact length in not important since you are only copying one ___________ Done: $\angle JAK \cong (congruent)\angle LPM$	

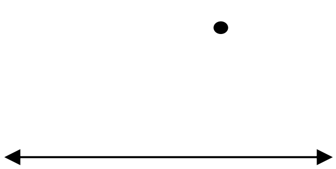
Follow the step above to practice copying the angles below onto the given rays. Show all markings.

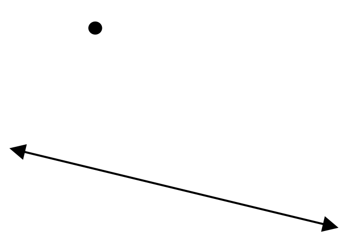


<u>Constructing a Parallel Line Through a Point.</u> (animation at http://www.mathopenref.com/constparallel.http)
(Parallel to line PQ, through point R)



Step 1: Draw a segment through point R that _________________ the line PQ at any angle. Mark point J where it intersects the line PQ.
Step 2: Set the width of the _______________ to any length **between** point R and J. Draw an _____ across lines $\overline{RJ}$ and $\overline{PQ}$ at J.
Step 3: Without changing the compass _________, draw a congruent _____ at point R in the same orientation as the arc in Step 2.
Step 4: Measure the distance from X to S.
Step 5: Copy that same distance from r to the lower arc intersection.
Step 6: Because the **corresponding angles** $\angle RJQ$ and $\angle XRS$ are congruent, lines $\overleftrightarrow{RS}$ and $\overleftrightarrow{PQ}$ are parallel.
Construct a line parallel to the line below that passes through the given point. Show All Markings.





8SG Function Operations Study Guide

Targets	Sample Question	Struggle	Meh	Yeah!	Assn
Add and Subtract Functions	Given f(x) & g(x), find f(x) + g(x) algebraically and graphically by hand and by technology. Show how with a table.				8A, 8B
Multiply Expressions	Give *f*(x) = 3x + 5 and *g*(x) = 5x +5. Find *f*(x)*g*(x)				8B, 8C,
Shifts (Vertical)	Given an equation, explain what would happen if f(x) changes to f(x) + 4.				8D, 8R

Vocabulary

Parabola: ____

Binomial ____

Vertical Shift: ____

Horizontal Shift: ____

Vertical Stretch: ____

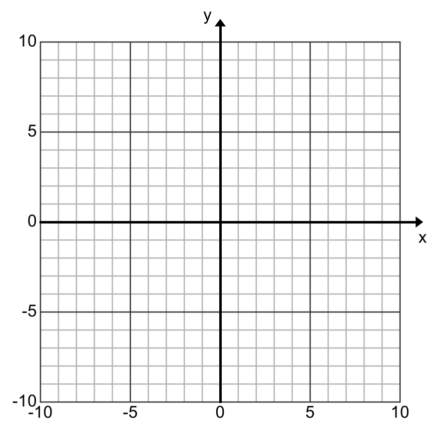
Adding/Subtracting Functions

Lines have only one dimension (width or height) but not ________. Adding or subtracting lines only changes how it looks, but does not change that they are lines. Adding lines creates a new _________. The input (x) gives an output *f*(x). Linear outputs can be added which give the same equation as adding the two linear functions.

x	*f*(x)	*g*(x)	*f*(x) + *g*(x)	*f*(x) – *g*(x)
1	6		12	0
2	9	8		1
3	12		22	2
4		12		3
5		14	32	

Fill in the missing values on the table to the right then use the table above to fill in the table below.

	Slope	Y-int	Equation
f(x)			
g(x)			
f(x) + *g*(x)			
f(x) – *g*(x)			

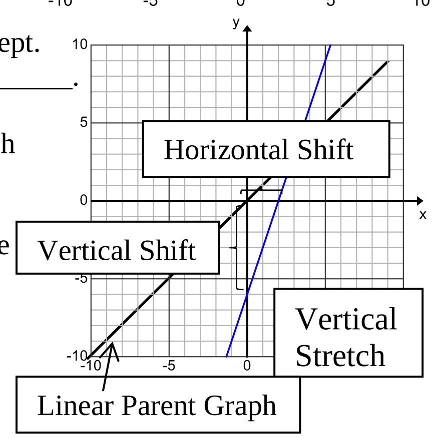


Graph the equations on the grid. Note that the points in the table can be added or subtracted just like the y-values on a graph to graph the sum or difference of the functions.

Transformations

The "parent graph of a linear equation is y = x. (In the parent equation, the slope is _____ and the y-intercept is ________

To shift the parent equation vertically (up or down), add or ________________ a y-intercept. From the parent graph, write the equation with a vertical shift of + 9. __________________.



Slope is used to show the steepness of the line/graph. When the slope is constant, the graph will be ___________. If the graph is not a line, there can still be a "stretch" over an interval. Another name for slope, then, is "vertical _____________" as the rise is "stretched" or "smooshed" compared to the slope of 1/1 in the parent equation. For the equation y = 3x – 6, the vertical stretch would be ____.

The vertical shift and vertical stretch are very obvious in y = mx + ___ form. Like the vertical shift, the horizontal (left or right) shift can be seen in the equation if the slope is factored out of the equation. $(y = m(x + \frac{b}{m})$.

For example: in the equation y = 3x – 6 graphed above, the vertical shift is –6 and the vertical stretch is ____. Factor out the stretch and the equation becomes y = 3(x – 2). The x-intercept is (2, 0) and the horizontal shift is 2.

HINT: after factoring out the slope/stretch, the shift has the opposite sign of the number in the _____________. In a linear equation, this is also the x-________________.

Multiplying Functions

Multiplying two one-dimensional figures (linear equations) results in a two dimensional figure. ("When you multiply, you ________ the dimensions.") This results in a dramatic change in your data. Complete the table.

x	f(x)	g(x)	f(x)g(x)
-5	-9	-1	9
-4		0	0
-3	-3		-3
-2	0	2	
-1		3	9

In the table, notice that the outputs repeat when the equations are multiplied.
Find the equation for f(x): _______________ Find the equation for g(x): ________________

What is the vertical shift of f(x)? ______ What is the vertical stretch of f(x)? ______
Write the equation for f(x) that exposes the horizontal shift: __________________

What is the vertical shift of g(x)? _______ What is the vertical stretch of g(x)? _______
Write the equation for g(x) that exposes the horizontal shift: __________________

Set up the equation for f(x)g(x) that shows the two equations (factors) being multiplied. ____________________

Stacking Method: This method uses basic multiplication practices. To multiply 24 X 18,

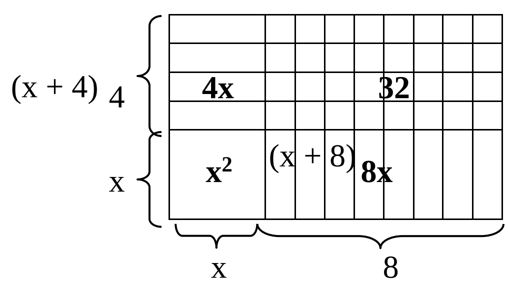
1. Stack one binomial on top of the other. x + 4
   x + 8
2. Multiply the same as multiplying multi-digit numbers like 24 X 18.

$$\begin{array}{r} x + 4 \\ \underline{x + 8} \\ 8x + 32 \\ \underline{x^2 + 4x \quad\ .} \\ x^2 + 12x + 32 \end{array}$$

$$\begin{array}{r} 20 + 4 \\ \underline{10 + 8} \\ 160 + 32 \\ \underline{200 + 40 \quad\ .} \\ 200 + 200 + 32 \end{array}$$

Box Method

1. Think of each term like the sides of a ___________________. For (x + 4)(x + 8), (x + 4) could be its length and (x + 8) could be the width.
2. Split the binomials to represent each ___________.
3. Multiply to ______________ the area of the smaller boxes.



Add like terms in your box together: $x^2 + 12x + 32$.

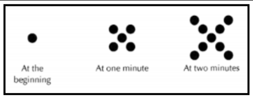
Distributive Method

1. A number next to a parenthesis means to multiply. Multiply every term each term in the first set of parentheses by each term in the second set of parentheses.
2. $(x + 4)(x - 5)$
   $= x(x - 5) + 4(x - 5)$ Distribute over addition= $x^2 - 5x + 4x - 20$ and combine like terms, so = $x^2 - x - 20$

Use **TWO** methods from above to multiply and check your answers (SYW)

1. (x + 6)(x + 9)
2. (x + 3)(x – 1)
3. (x + 5)(2x + 2)

9SG Arithmetic and Geometric Sequences and Applications Study Guide

Targets	Sample Question	Ugh	Okay	Got it	Assn
Interpret and model Arithmetic Story Problems.	 Draw a representation for 3 and 4 minutes if the pattern continues.				9A, 9B
Identify & write Arithmetic Recursive Equations	Given the sequence 12, 6, 4, 2, find the recursive equation in proper function notation.				
Identify & write Arithmetic Explicit Equations	Given the sequence 3, 6, 9, 12, find the explicit equation in proper function notation.				
Identify, and create Geometric Graphs & tables	Graph the Above questions				
Identify & write Geometric Recursive Equations	Write the recursive equation (in proper function notation) given a table				
Identify & write Geometric Explicit Equation	Write the explicit equation (in proper function notation) given a table.				
Recognize that simple interest is an example of a linear arithmetic sequence.	For a $1000 loan, Katie could not make any payments for 10 years, but she would have to pay 15% interest on the $1000 for each year of the loan. Graph				
Identify compound interest as geometric sequences/ exponential growth on a graph & table	For a $1000 loan, Katie could not make any payments for 10 years, and had to pay 10% interest on the $1000 for but the interest is compounded monthly. Create a table and graph the sequence.				
Compound Interest with an equation	Above—Write an equation to calculate much she would pay over the 10 years.				
Growth and Decay	A tarantula farm starts with 2 tarantulas that love each other very much. How many will he have after 2 years if they have 200 babies every 6 months.				
Recognize that elements of a compound interest equation.	Given the equation $f(x) = 5(1.35)^x$, find the initial investment, the growth/decay rate, and the amount of the loan after 5 years.				

While there are other kinds of sequences, this unit only covers Arithmetic and Geometric Sequences.

Vocabulary

Sequence: ______________________________

Term: ______________________________

Arithmetic Sequence: ______________________________

Geometric Sequence: ______________________________

Common Difference: ______________________________

Common Ratio: ______________________________

Recursive Equation: ______________________________

Explicit Equation: ______________________________

Exponential: ______________________________

Growth: ______________________________

Decay: ______________________________

Simple Interest: ______________________________

Compound Interest: ______________________________

Arithmetic Sequence

Arithmetic sequences come from _______________ equations and tables. The graph of an Arithmetic Sequence is a _________. An Arithmetic Sequence has a common difference (*d*) that increases or decreases at a __________ rate by addition or subtraction from consecutive terms. An arithmetic sequence is "proportional" if there is no vertical shift or y-intercept other than (0, 0).

X	f(x)
1	7
2	9
3	11
4	13
5	15

Two kinds of formulas are written from a sequence: the _______________ formula and the explicit formula. The recursive formula reveals how much the values change from one step to the next with a ______________ difference.

The table to the right shows a common increase (difference—d) of ______.

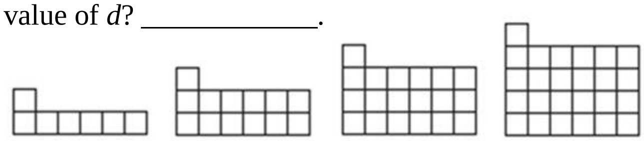
Recursive Formula

In function notation, sometime *n* is used instead of x. So *f(n)* is the output when x = n. The term before *n* is one step before *n* or ($n – 1$). The output for this term is $f(n – 1)$. An Arithmetic sequence changes from $f(n – 1)$ to $f(n)$ by adding or subtracting a common difference (*d*).

The table above adds 2 for every consecutive change in x. So the recursive function of this table when x = n is $f(n) = f(n – 1) + 2$. Some think of it as "What it is = what it was + the difference." To find what a step "is", 2 is added to the previous steps output.

Explicit Formula (y = mx + b)

An explicit formula gives the outcome for any input *n*. The y-intercept (where x = 0) can be written as $f(0)$. In an Arithmetic Sequence, *d* is the common difference, so an explicit equation (y = mx + b) can be written as $f(n) = dn + f(0)$.. For the table above, what is the value of $f(0)$? ______ What is the value of *d*? ____________.



If the first figure is $f(1)$, what would be $f(0)$? ______

What would be *d*? ____

Write the explicit equation for the pattern. ________________ Write the recursive equation. __________________

To write an equation from a sequence, you need to know which stage the number represents. For the sequence, 5, 8, 11, 14, ...$f(2) = 5$ means that the _______________ stage is 5. The common difference is ______, so the explicit equation would be y = 3x – 1 because .$f(0)$ = ______.

Geometric Sequence

A geometric sequence has a _______________ ratio "*r*". Multiply or divide to find the next __________.

Recursive Formula

X	Y	
1	4	x 2
2	8	x 2
3	16	x 2
4	32	x 2
5	64	

Note that the output values double in this table. (The y-values have a common ratio of 2.)

The recursive equation for a geometric sequence can be written as $f(x) = f(x – 1)(r)$. $F(x–1)$ is the prior term, and r is the common ratio. Above, the **recursive** ______________ in function notation would be, $f(n) = f(n – 1)(2)$ or $f(n) = 2f(n – 1)$.

Explicit Formula

The **common ratio** (*r*) is the number used to multiply an output to get the next output. This ratio is written with an _______________ to show the number of times or steps (*x* or *n*) is base is multiplied. The step before *x* is ($x – 1$). Geometric equations often multiply the first term rather than the 0^{th} term. The explicit _______________ for a geometric sequence **can** be written as $f(n) = f(1)r^{(n-1)}$ where $f(n)$ is the nth term where $f(1)$ is the first term and r is the common ratio. An explicit equation could also be written using the y-intercept as $f(n) = f(0)r^{(n)}$ or from step 2 as in $f(n) = f(2)r^{(n-2)}$. The equation depends on which step the sequence begins.

X	Pattern	Y	Short Hand
1	3	3	3×2^0
2	3 x 2	6	3×2^1
3	3 x 2 x 2	12	3×2^2
4	3 x 2 x 2 x 2	24	3×2^3
5	3 x 2 x 2 x 2 x 2	48	3×2^{4n}
n	?	$f(n)$	$3 \times 2^{n-1}$

The common ratio (or multiplier *r*) can be seen in the 4-column table to the left. Notice the repeating multiplier is the same as the multiplier in the pattern's short ________. Note that for the nth value, **the exponent is (n – 1) because the table starts on step 1**.

In the short _________, note the relationship between the x (input) value and the exponent. The exponent depends on which the first input in the table. How would you write the exponent if the table started on step 2? ___________

Circle whether the following tables are **arithmetic or geometric.** Give the **common difference or ratio** and write the **recursive and explicit equations**.

X	1	2	3	4
Y	6	12	24	48

Arithmetic or Geometric?
Difference/Ratio: ________
Recursive:_______________
Explicit:______________

x	1	2	3	4
$f(x)$	9	27	81	243

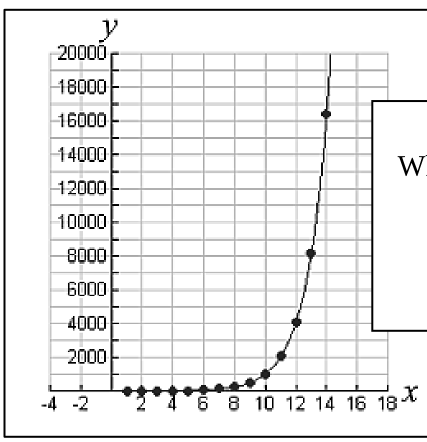
Arithmetic or Geometric?
Difference/Ratio: ________
Recursive:_______________
Explicit:______________

x	1	2	3	4
$f(x)$	9	18	27	36

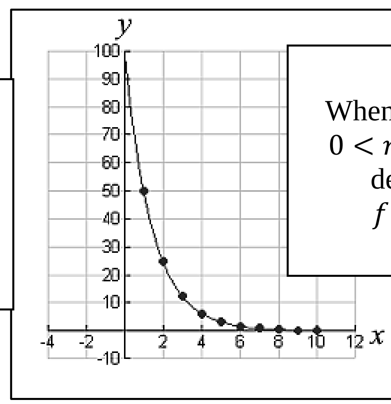
Arithmetic or Geometric?
Difference/Ratio: ________
Recursive:_______________
Explicit:______________

Exponential Growth and Decay (Geometric Sequence)

Exponential growth and decay, occurs by a fixed percent or ratio (geometric growth or decay). For exponential growth, the rate of change _______________ with time – it grows faster and faster. For exponential _____________, the rate of change decreased with time – the amount of decay slows down.



Growth:
When the common ratio is $r > 1$ the function is increasing (growth)
$f(x) = 1(2)^x$



Decay:
When the common ratio is $0 < r < 1$ the function is decreasing (decay)
$f(x) = 100(0.5)^x$

In order for a value to grow, a multiplier must be larger than ____. Multiplying by 1 (or 100%) would make a number or any value stay the same. The number above 1 (or 100%) indicates the percentage of the growth.

Multiply 4(1) = ____ 4(1.2) = ____ (20% growth) 4(1.75) = _____ (75% growth) 4(2.5) = ____ (150% growth)

The explicit equation for exponential **growth** is often written $\boldsymbol{f(x) = a(1 + r)^t}$ or $\boldsymbol{f(x) = f(0)(1 + r)^t}$. $f(x)$ is the total amount, a or $f(0)$ is the amount of money at the start or step zero, and *t* is the number of compounding periods. The common ratio is r (percent of change expressed as a decimal).

A number or value will decrease if multiplied by a number less than ____. For exponential **decay**, we use the formula: $\boldsymbol{f(x) = a(1 - r)^t}$.

Multiply 4(1) = ____ 4(.8) = ____ (20% decay) 4(.25) = _____ (75% decay) 4(.05) = ____ (95% decay)

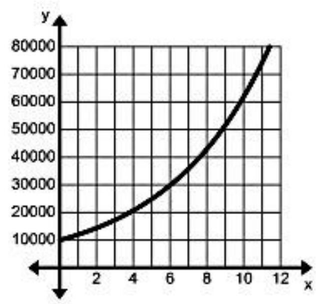
Example of explicit formulas for growth and decay would be

$f(n) = 4(1.2)^t$ would have a 20% growth $\quad$ $f(n) = 4(1.75)^t$ would have a 75% growth
$f(n) = 4(0.8)^t$ would have a 20% decay $\quad$ $f(n) = 4(0.75)^t$ would have a 25% decay.

Notice that for growth we use $(1 + r)$ and for _________ we use $(1 - r)$. Why? _________________________
____

Look at **GROWTH** and **DECAY** in the following situations using a graph, table, and an equation.
A business had a $10,000 profit in 2000. Then the profit increased by 20% per year for the next 10 years.

Graph



Complete the **Table:**

Note the change in *n*.

n	*f(n)*
0	$10,000
4	
6	$30,000
9	
10	

Equations

Explicit:

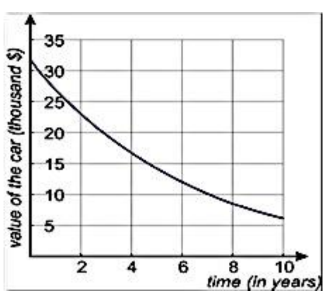
$f(t) = 10{,}000(1.20)^t$

Recursive: (write it)

$f(t) =$ ____________

Look at **GROWTH** and **DECAY** in the following situations using a graph, table, and an equation.

Graph



Complete the **Table:**

Note the change in *t*.

t	*f(t)*
0	$32,000
2	
4	$16,700
5	
8	

Equations

Explicit:

$f(t) =$ ________

Recursive: (write it)

$f(t) = f(t-1)(0.85)$

<u>Geometric Growth (Compound Interest):</u>

You purchase a car for $15,000 and the loan has an interest rate of 5% compounding each year.

Make a table:

t	Pattern	$f(t)$	S.H.
0		$15,000	
1		$15,750	
2			

Write an **equation** for the amount of the money you owe after "*t*" years. _________________

If you make NO payments, what is the total amount due after eight years? ______________

<u>Geometric Decay (Compounded Loss):</u>

Your friend purchases a car for $15,000 and knows that his car will depreciate 5% each year in value.

Make a table:

t	Pattern	$f(t)$	S.H.
0		$15,000	
1		$14,250	
2			

Write an **equation** to represent the value of the car after "*t*" years.________________________.

Estimate the value of the car after eight years.
____

Simple Interest (Arithmetic Sequence)

Not all growth is exponential. **Simple interest adds or subtracts the same value at every period**. The equation that shows that a quantity grows by the same amount at every step (or constant rate) is ________________. The equation starts with the initial value (y-intercept). The amount added every period is the common difference or rate of change.

To calculate how much a value will change at each step, the initial amount will be multiplied by the percent.

For example: An investment of $3,000 is made at an annual simple interest rate of 5%. This means that $3000 is invested and it will grow 5% for every time period.

The amount of growth (or common difference/rate of change) comes from **3000 X .05 = 150** per step.

Make a table:

t	Pattern	$f(t)$	S.H.
0		$3,000	
1	$3,000 + $150		
2		$3,300	
5			

What is the y-intercept? __________

What is the slope? __________

Write the equation: _______________

Find how much money you would have after 8 years. $f(8) =$_____________

This would be an example of a(n) ______________ sequence and the graph would be _____________

Simple interest is written in the form y = mx + b where y is ______________________, m is the ____________ difference, x is the number of _________________, and b is ____

**Note that Simple Interest is calculated using y = mx + ___. Define the variables of this equation used to calculate simple interest.

Y = _____________________________________

X = _____________________________________

M = _____________________________________

B = _____________________________________

<u>COMMON ERRORS:</u>

When writing equations for simple interest, students confuse rate of change with percent growth.

In the example above, with an investment of $3,000 is made at an annual simple interest rate of 5%. This means that $3000 is invested and it will grow 5% for every time period. Students often write the equation as *f(x)* = 3000 + 1.05x.

A table reveals that instead of earning $150 per time period, the money only increases by $_______ per period.

t	Pattern	$f(t)$	S.H.
0	3,000	$3,000	
1	3,000 + 1.05		
2	3,000 + 1.05+ 1.05		

WRONG!!

Calculate the amount of change from the percentage **first and then add/subtract**.

Sometimes students calculate the rate of change correctly, but think they have to add a 1. This is only for geometric growth where the original amount is included in the multiplier.