1. Please find your table by matching the definition attached to this packet to a word printed on the vocabulary sheets on each table.

2. While you are waiting for me to get started see if everyone agrees with the definition to word matches at your table. Then can you categorize the words at your table; how are the words related?

3. This handout includes only a small sample of the complete activities, vocabulary, and assessments that I will share with you through Dropbox. To make sure you get the complete materials please send an email to my school address: juliann.doris@del-valle.k12.tx.us or make sure you enter your email address on the sign in sheet I should have at your table. Dropbox is a free file sharing service.

4. The poster you will want in your room:

Instead of IDK say

"Would you please restate the question?"

"This is what I have determined so far….."

"Would you please tell me where I can find more information?"

"May I please have more information?"

"May I please have more time to think?"

5. Jobs, that I do not like, for which I have employed students to complete for me in my classroom:

Calculator Managers-

Delivery Agent-

Randomizer Specialist-

Attendance Specialist-

Warm-Up Director-

Vocabulary Manager -

Morale Officer-

Environmental Manager-

Resource Manager-

Tactical Officer-

Admittance Officer-

Reflection Officer -

Telecommunications Officer-

Questioning Strategies

Never ask a question that requires only a yes or no response.

Let students respond to questions three ways: silently (to digest the question), with a partner or a team (to get assistance with a response), and then randomly call on a student to paraphrase how the partners answered the question (to verify and validate the response). This will also help eliminate the, "I don't know," response.

Instead of, "Are there any questions?"

Try,

"Take a minute to silently review what we just talked about." Pause for one minute.

"Now write down two or three sentences that summarizes what we just learned. Or write a question about what you still do not understand." Pause until every one has written something down.

"Now stand up and turn to your partner and the taller person will share what she has written first. Then the shorter person will share out second. When you are both done, sit down."

When all students are seated say, "Now I am going to call on someone to tell us one thing that you and your partner said we discussed today." Then randomly (through any means: random number generator on the calculator, name cards, roll of dice) call on a student, "Jimmy, please tell us one thing that you and your partner said we discussed today."

Give appropriate praise and clarify if necessary, then call on more groups until you are satisfied that students understand the concept.

Randomization

Many teachers call on students by choosing a popsicle stick from a can. Think about adding: volunteer, randomizer's pick, everyone writes on your whiteboard, everyone shares with your partner, everyone wave response (just like at a stadium), and (my favorite) everyone pop quiz. This will help keep you and your students on your toes and add variety in the types of student responses.

When I do a pop quiz I have students write their answers on a ½ sheet of paper, trade papers, and then call on a few students to read the answers on the paper they have, other students critique or decipher the answers, then have the students trade back, let student edit their answers, and then have them turn in the pop quizzes.

Assessment/Grading Strategies

A quiz a day keeps apathy away… and can ease anxiety too. My best educational magic trick has been giving students a daily quiz. At the end of almost every lesson I give a two to four question quiz over the concepts just presented. I always let students use their notes. As soon as I started doing this (about four years ago) I saw my students sit up, take notes, and ask questions.

The key is to give easy quizzes at first with lots of support and the gradually pull the supports away.

I start the year telling students they will never get anything below a 60% as long as they try to answer every question. Even if they answered every question incorrectly they will still get at least a 60%. I also let them know they can correct any assignment or assessment for a 75% as long as they work with me in tutorials.

The quizzes start from the class notes. The quizzes are exactly the same as the class practice problems. So the students see value in taking notes. Once they are trained to take notes and they start telling me the quizzes are too easy, and then I make the problems similar but not the same as in the class notes. That is when I let them use partners so that they start talking about process. Then I go to different A and B quizzes so students have to talk about the process to solve problems.

Later on in the year I change from a minimum of 60% to a 50%. I never go below a 50%. If a student refuses to do a quiz that is a behavior problem and that is a different issue.

Types of Assessments

Traditional quizzes

Matching card quizzes works well with definitions and various representations of functions.

Short essay quizzes but give the students a word bank so that they have some vocabulary to pull from.

Problem hunt quizzes. I add decoy answers to build in extra practice for those students who need it. This is more of a whole class period practice day.

Types of Grouping

I have always had my students sit at tables – no student desks. We do not work alone; why make students work alone. Most work places are collaborative.

We have assigned seating for each grading period when we do not do the vocabulary seating. We rarely let students self-select.

We split the class in half and half the students go to another room with my co-teacher (class size matters).

Assign a student (the most challenging student) to create the seating chart. Students put a lot of thought into this and tell us how hard it was to create a good seating chart.

Group by ability but try to keep the abilities somewhat close together. Never put your strongest with your weakest…they will frustrate each other.

Types of Incentives

Class cash for any behavior I want to see repeated: answer a question, ask a question, working on warm up, presenting a problem, working as a group, taking notes, sometimes just for being quiet and attentive. Cash can be redeemed for extra points, help on an assessment, restroom pass, anything students find valuable.

Saying please and thank you will take you further than you expect. We get in a rush and sometimes forget to give students the common courtesy we expect as adults.

If you have a "special" talent sometimes students will work diligently to see that talent. Sometimes a good story or joke will work.

Ways to Redirect Behavior

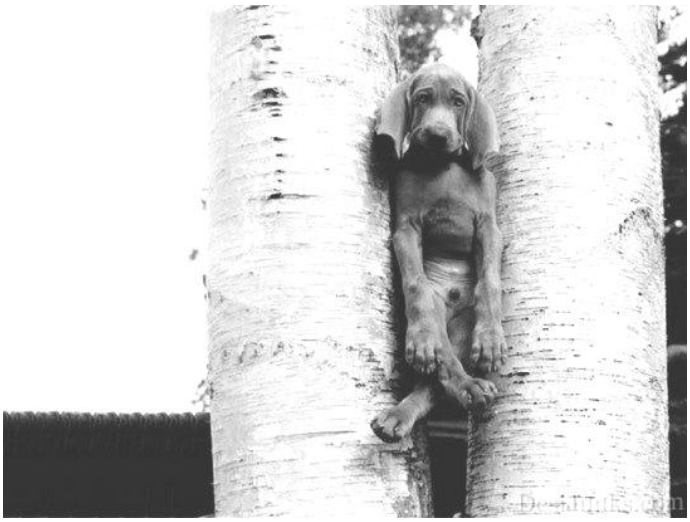
Self Correction Form: student is isolated to think about the behavior and come up with a solution.

Class Cash: sometimes money can buy your way out of trouble. Students had to start paying me if they accidently used profanity in class.

Physical activity: Student athletes suggested this as a way to repent. So if a student offers to do push-ups, sit-ups, jumping-jacks, or whatever physical activity to help him remember to correct his behavior I will give it a try. They will earn a living with a strong mind or strong body. If the mind is weak I'll let my student work on the body. So sometimes profanity can be worked off; and, if they cannot pay to use the restroom I will let them do push-ups. Physical activity is always a student choice.

Justification: Why are we learning this?

Math is hard, life is hard; therefore, math is life. Mathematics is basically an approach to solving difficult problems. The techniques and strategies that we learn in math class are techniques and strategies we can use to solve any difficult problem. If you can persevere through your struggles and frustrations in math, then you will be prepared to persevere through your struggles and frustrations in life. What doesn't kill you makes you stronger.



Self - Correction Opportunity

I fill out this form to examine my behavior so that I may be more successful in class.

Last Name:_____ First Name:_____ Middle Initial:_____

ID number:_____ Grade:_____ Date:_____ Time:_____

Location of Incident: Class Room _____ Teacher: _____ Period:_____

I was given "time out" to complete this form because I chose to: (circle all that apply)

Disrespect Myself **Disrespect Others** **Disrespect Property**

Act Unprofessionally **Act Irresponsibly** **Other (see below)**

Describe exactly what happened. (Use complete sentences.)

_____

Although I may not have control over other's behavior I realize I am responsible for my own behavior choices. My behavior and attitude in class have a direct affect on my grades; therefore I will do my best to improve both my behavior and attitude.

Use complete sentences below.
To keep this from happening again, when I am in a similar situation I will…

Student Signature: _____

Transformations of Polygons Activity

Day 1:	Conclude how vertical transformations change polygons using small group presentations of graphs and tables.
Day 2:	Conclude how horizontal transformations change polygons using small group presentations of graphs and tables.
Day 3	Review. Compare and contrast the effects of horizontal and vertical transformations on polygons using an essay.
Day 4:	Conclude how reflections over the x-axis change polygons using small group presentations of graphs and tables.
Day 5:	Conclude how reflections over the y-axis change polygons using small group presentations of graphs and tables.
Day 6:	Conclude how graphing the inverse changes a polygon using small group presentations of graphs and tables.
Day 7:	Review. Compare and contrast the effects of reflections of functions over the x-axis and y-axis using an essay. Describe similarity of reflections to the inverse function.
Day 8:	Conclude how graphing a stretch or a dilation with a scale factor greater than 1 changes a polygon using small group presentations of graphs and tables.
Day 9:	Conclude how graphing a compression or a dilation with a scale factor between zero and 1 changes a polygon using small group presentations of graphs and tables.
Day 10:	Review. Compare and contrast the effects of dilations when a <1 and dilations when 0< a< 1 on functions using an essay.
Day 11:	Assessment. Given an image and a transformation describe the pre-image.

The procedure for each day is the same.

Divide students into 5 groups. (You will want to keep students in groups for the all the transformation activities - two weeks.) If you need more than 5 groups just have some groups working with duplicate activity cards.

Write the different starting points on the board: origin, quadrant I, quadrant II, quadrant III, and quadrant IV.

Hand out one quadrant card to each group. Hand out the directions and presentation guide to each student. This will be a place to take notes. Give each group a large piece graph paper or transparency or a space on the board to make their graphs.

You may want to demonstrate what is expected by transforming and presenting the coordinates (3, 1), (3, 4), (5, 2), (6, 2), and (6, 1).

After you explain what is expected let students work in their groups and monitor their progress.
Ensure students understand and are following expectations. When students have completed their graph and answered the presentation questions make sure they post their work on the board. When all groups have posted their work and you have checked it, have students present their findings to the class.

Formal Assessments occur on
Day 3 Compare and contrast the effects of horizontal and vertical transformations on polygons using an essay.
Day 7 Compare and contrast the effects of reflections of polygons over the x-axis and y-axis using an essay.
Day 10 Compare and contrast the effects of dilations when a <1 and dilations when 0< a< 1 on polygons using an essay.
Day 11 Given an image and a transformation describe the pre-image.

Transformations of Polygons Directions: Vertical Translations

First copy (using pencil) the table you were given onto your graph paper in the space marked Original Coordinates.

Plot the coordinates from the table in pencil on the coordinate grid. Connect the points. This is your pre-image.

Translate the pre-image two units up. Draw the new graph in green; this is image 1. Determine how each point moved and make a new table in green under First Transformation showing the location of each point after the transformation.

Translate the pre-image three units down. Draw this new graph in red; this is image 2. Determine how each point moved and make a new table in red under Second Transformation showing the location of each point after the transformation.

Answer the following questions:

1. Name the polygon you just graphed. _____

2. What is the domain of the polygon? _____

3. What is the range of the polygon? _____

4. Compare what the translations up and down do to the x-coordinate points in the table of the pre-image to the image.

5. Compare what the translations do to the y-coordinate points in the table of the pre-image to the image.

6. Compare what the translations up and down do to the shape of the polygon of the pre-image to the image.

7. Speculate what a vertical translation will do to the shape of any figure.

8. Make a conclusion: what does vertical translation mean?
   Generate a symbolic representation of a vertical translation of k units.

Be prepared to present your findings to the class. You may pick a speaker or you may each present part of your results. (Speakers will be paid.)

Transformations of Functions Activity

Lesson 1: Conclude how vertical transformations change functions using small group presentations of graphs and tables.

Lesson 2: Conclude how horizontal transformations change functions using small group presentations of graphs and tables.

Lesson 4: Conclude how reflections over the x-axis change functions using small group presentations of graphs and tables.

Lesson 5: Conclude how reflections over the y-axis change functions using small group presentations of graphs and tables.

Lesson 6: Conclude how graphing the inverse changes a function using small group presentations of graphs and tables.

The procedure for each day is the same.

Divide students into 5 groups. (You will want to keep students in these same groups for all the transformation activities - two weeks.)

Write the different function types in mixed order on the board: exponential, absolute value, linear, cubic, quadratic, and square root.

Hand out one function card (linear, absolute value, exponential, quadratic, square root or cubic) to each group. Hand out the directions and presentation guide to each group. Give each group a large graph paper or a space of the board to make their graphs.

You may want to demonstrate what is expected by transforming and presenting the function $y = \frac{12}{x}$.

After you explain what is expected let students work in their groups and monitor their progress.
Ensure students understand and are following expectations. Hand students a four function calculator if they seem to be having difficulty with the calculations. When students have completed their graph and answered the presentation questions make sure they copy their work and all other student group graphs. When all groups have posted their work and you have checked it, have students present their findings to the class.

Formal Assessments occur on
Day 3 Compare and contrast the effects of horizontal and vertical transformations on functions using an essay.

Day 7 Compare and contrast the effects of reflections of functions over the x-axis and y-axis using an essay.

Transformations of Functions Directions: Vertical Translation when f(x) becomes f(x) + k

1. Copy your function and table in pencil under Original Coordinates. Complete your table using the function; and, plot the points on your graph. Connect the points. This is your parent function.

2. Translate the parent function two units up. Draw the new graph in green. Determine how each point moved and make a new table in green under First Transformations showing the location of each point after the transformation.

3. Translate the parent function three units down. Draw this new graph in red. Determine how each point moved and make a new table in red under Second Transformation showing the location of each point after the transformation.

Answer the following questions:

1. Identify the parent function as linear, quadratic, exponential, absolute value, cubic, square root, or rational. Then describe the visual characteristics of the function that identifies the family type.

2. Express the domain of the function using interval notation. _____

3. Express the range of the function using interval notation. _____

4. Determine what the translations up and down do to the coordinate points in the table of the parent function. What happened to the x –coordinates in each translation? What happened to the y-coordinates in each translation?

5. Explain what happened to the domain and range of the function after each translation.

6. Explain what happened to the shape of the function after each translation.

7. Speculate what a translation up or down will do to the coordinate points and shape of any function.

8. Make a conclusion: what does vertical translation mean?
   Generate a symbolic representation of a vertical translation of k units.

Be prepared to present your findings to the class. You may pick a speaker or you may each present part of your results. (Speakers will be paid.)

Name _____ Vertical Transformations Quiz

#1 and 2. Transformations of Points

If I Start with this point	and it Becomes this point	then the Transformation was
(x, y)	(x, _____)	Vertical Translation Up k units
(x, y)	(x, _____)	Vertical Translation Down k units

3 and 4. Transformations of Functions

If I Start with this function	and it Becomes this function	then the Transformation was
f(x)	_____	Vertical Translation Up k units
f(x)	_____	Vertical Translation Down k units

Name _____ Horizontal Transformations Quiz

1. A translation of a shape right or left will _____

   the size and orientation of any shape.

2. If the pre-image coordinate point is (9, 5) and the image coordinate point is (4, 10) explain how the pre-image was transformed to the image.

   Write your answer using complete sentences and include six of the following words: down, horizontally, left, right, translated, units, up, vertically.

Summary Notes for Transformations

Transformations of Points

If I Start with this point	and it Becomes this point	then the Transformation was	For Example Start with (4, 6) let v = 7, h = 5, s = 3 or s = 0.5
(x, y)		Vertical Translation Up k units	(4, 6) becomes
(x, y)		Vertical Translation Down k units	(4, 6) becomes
(x, y)		Horizontal Translation Left h units	(4, 6) becomes
(x, y)		Horizontal Translation Right h units	(4, 6) becomes
(x, y)		Reflection over the x-axis	(4, 6) becomes
(x, y)		Reflection over the y-axis	(4, 6) becomes
(x, y)		Inverse Transformation	(4, 6) becomes
(x, y)		Dilation Enlargement (Stretch) when the scale factor (s) s > 1	(4, 6) becomes
(x, y)		Dilation Reduction (Compression) when the scale factor (s) 0< s < 1	(4, 6) becomes

Transformations of Functions

If I Start with this function	and it Becomes this function	then the Transformation was	For Example Start with $y = x^2$ let v = 7, h = 5, s = 3 or s = 0.5
f(x)		Vertical Translation Up k units	
f(x)		Vertical Translation Down k units	
f(x)		Horizontal Translation Left h units	
f(x)		Horizontal Translation Right h units	
f(x)		Reflection over the x-axis	
f(x)		Reflection over the y-axis	
f(x)	$f^{-1}(x)$	Inverse Transformation	Do not worry about this one this year.

Transformation of Polygons Cards

Quadrant I
Vertical

X	Y
5	7
5	14
10	14
10	12
13	12
13	10
8	10
8	7
5	7

Quadrant III
Vertical

X	Y
-16	-8
-11	-8
-11	-10
-8	-10
-8	-12
-13	-12
-13	-15
-16	-15
-16	-8

Quadrant IV
Vertical

X	Y
9	-4
9	-9
7	-9
7	-12
5	-12
5	-7
2	-7
2	-4
9	-4

Transformation of Functions Cards

$y = x$

X	Y
-3	
-2	
-1	
0	
1	
2	
3	

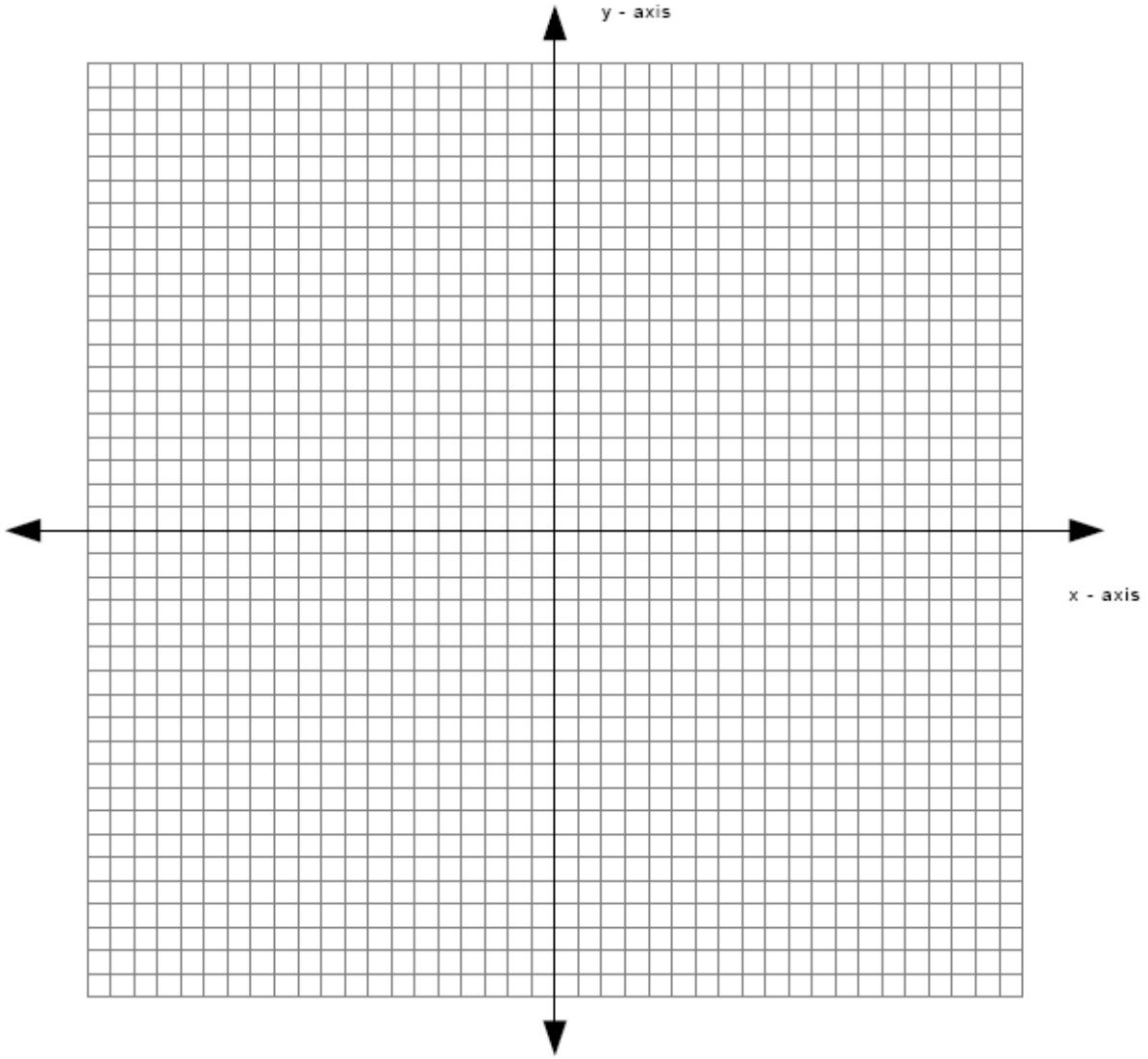
$f(x) = x^2$

X	*f*(x)
-3	
-2	
-1	
0	
1	
2	
3	

$f(x) =$ _____

X	*f*(x)
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3

Transformations: Which transformation are you doing today? _____



Original Coordinates _____

X	Y

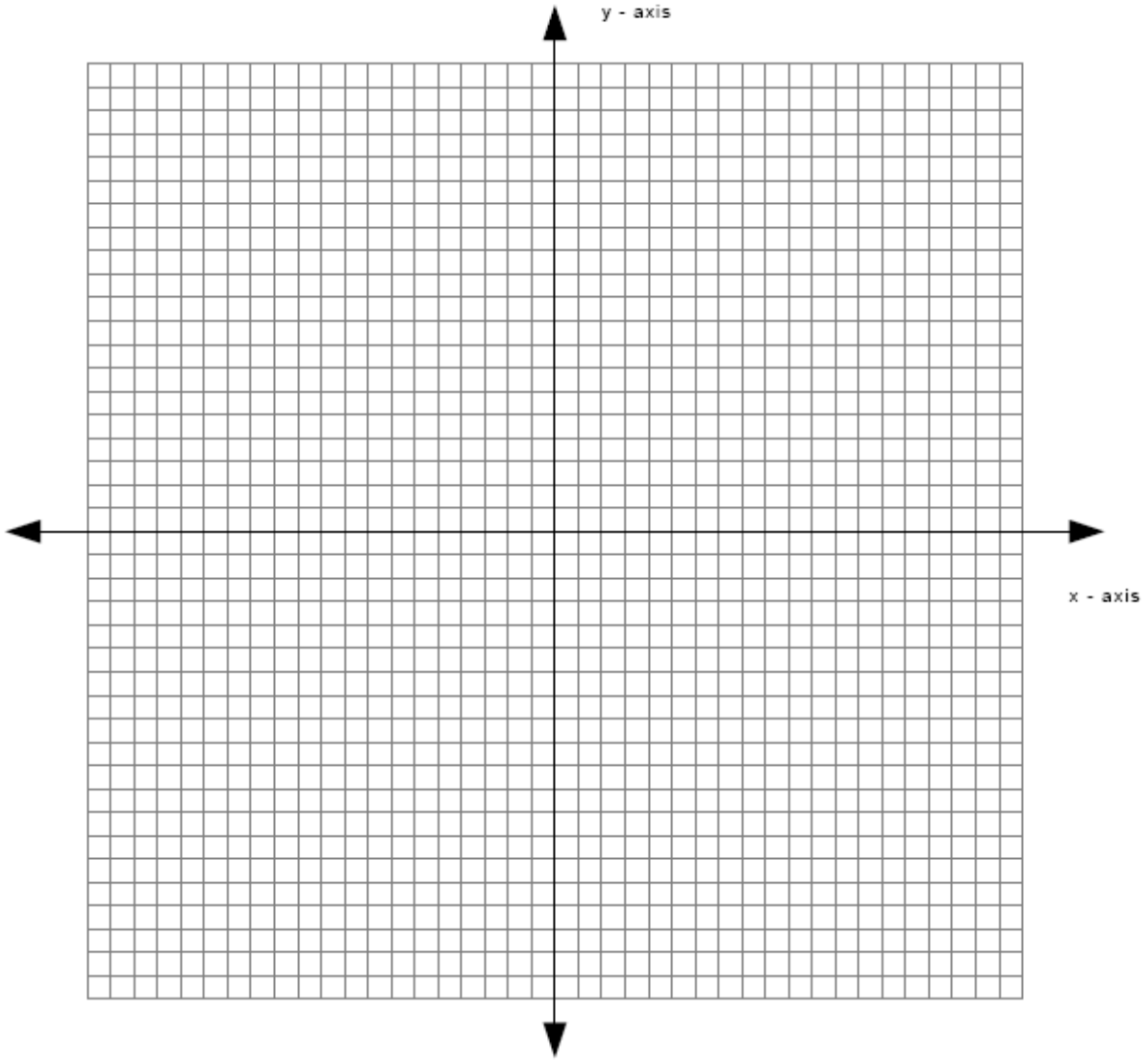
First Transformation _____

X	Y

Second Transformation _____

X	Y

Transformations: Which transformation are you doing today? _____



Original Coordinates _____

X	Y

First Transformation _____

X	Y

Second Transformation _____

X	Y