Creating *YOUR* 21st Century Math Class

… One Task at a Time

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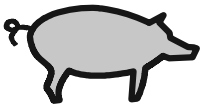
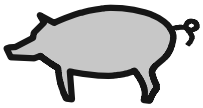
Mathematical Habits of Mind

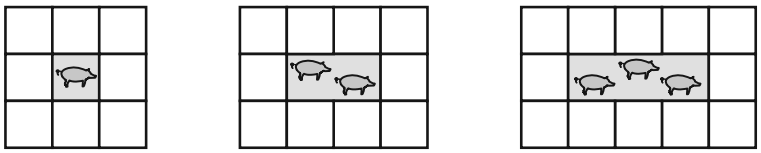
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.



Pig Pen Algebra



Farmer John is making a pig pen. He is short on materials so he is making the pen out of bales of hay. These bales are shaped as cubes. Farmer John likes to keep things simple, so whenever he gets another pig, he just extends the pen as shown below. Your job is to help Farmer John write a formula to tell him how many bales of hay he will need for a given number of pigs.



1. How would you move the existing bales to make room for another pig?

2. In the space above, draw pens that would hold 4 and 5 pigs respectively.

3. How many bales of hay must be added to an existing pen, to make room for the next pig?

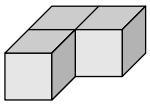
4. Without anymore drawings, complete the chart below for P number of pigs and B number of bales.

P (pigs)	1	2	3	4	5	6	7	8	9	10	20	50
B (bales)	8	10	12									

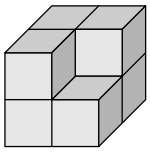
5. How did you figure out your answers for 20 and 50 pigs?

6. According to the pattern in the chart, how many bales would you predict are needed for no pigs?

7. Write an equation that represents the number of bales B needed to pen P number of pigs.



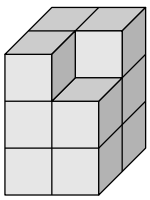
8. Show how to use your new equation to find how many bales are needed for 100 pigs.



9. How many pigs could be penned by 96 bales of hay?

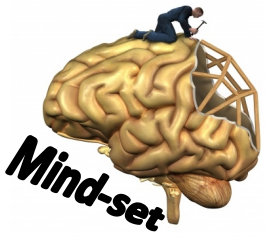
ASSIGNMENT

A tower is built up as shown on the right. Write an equation that represents the number of blocks T needed to build a tower S stories tall.



Teaching Students to

THINK, COMMUNICATE, COLLABORATE & CREATE through Effective Teaching Principles



4 Claims:

Concepts & Procedures, Problem Solving, Communicate Reasoning, Modeling & Data Analysis

Math Goals

(Dual Targets)

Content Target:

Practice Target

COMMON CORE STATE STANDARDS INITIATIVE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Representations

(Multiple Representations)

Meaningful Discourse

(Feedback)

Purposeful Questioning

(Dig Deeper & Reach Higher)

Procedural from Conceptual

(Progression)

Tasks & Access

(Engagement & Low Floor/High Ceiling)

Productive Struggle

(Monitor & Adjust)

Evidence of Student Thinking

(Collect & Reflect)

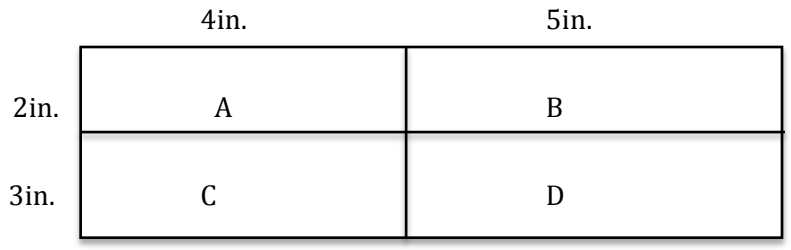
Rigor: Fluency, Deep Understanding, Application, Dual Intensity

Algebra 1 Names: _____
TVUSD **Date:**_____ **Period:** _____

Polynomial Farm

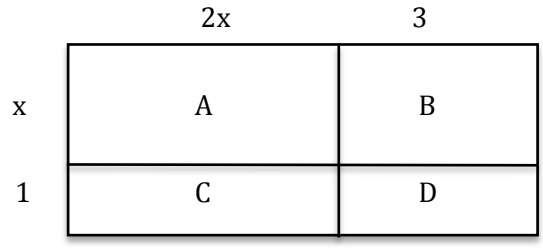
Part I (Intro & Investigate)

1. Find the perimeter and area of each small rectangle (A, B, C and D). Find the perimeter and area of the large rectangle composed of A, B, C and D.



	Perimeter	Area
A		
B		
C		
D		
Large Rectangle		

2. Find the perimeter and area of each small rectangle (A, B, C and D). Find the perimeter and area of the large rectangle composed of A, B, C and D. All measures given are in inches.



	Perimeter	Area
A		
B		
C		
D		
Large Rectangle		

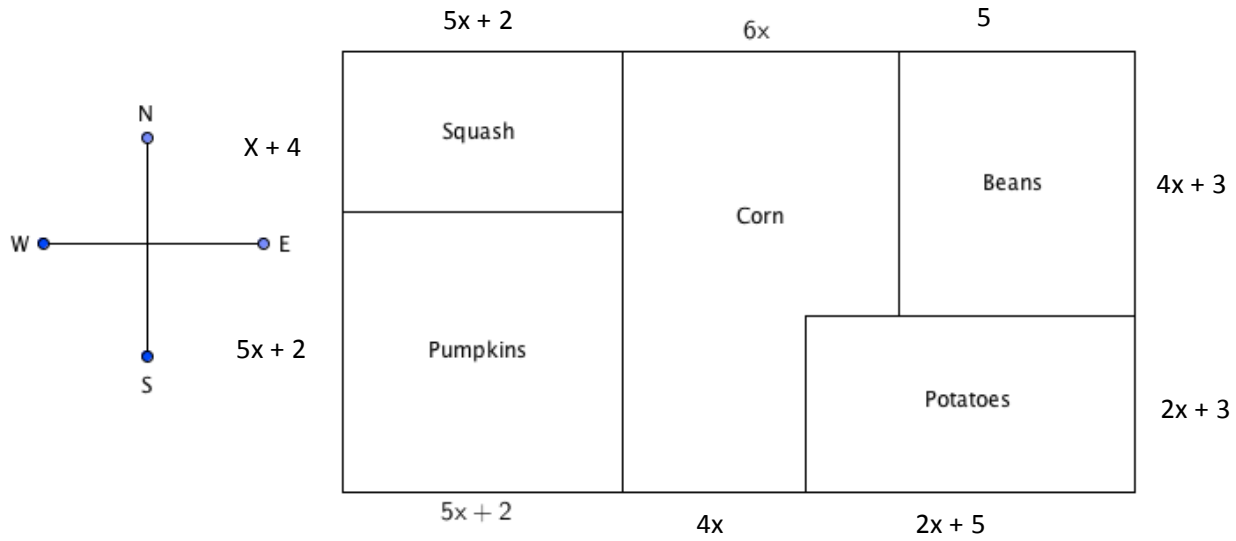
Algebra 1 Names: _____

TVUSD **Date:**_____ **Period:** _____

Polynomial Farm

Part II (Apply)

Directions: Farmer Bob is planting a field of crops this spring. He wants to plant squash, pumpkins, corn, beans, and potatoes. His plan for the field layout in feet is shown in the figure below. Use the figure and your knowledge of polynomials, perimeter, and area to solve the following:



3. Write a simplified expression that represents the length of the south fence line.

4. Find the perimeter of the pumpkin field.

5. Find the area of the squash field.

6. Find the perimeter and area of each section of the Field.

	Perimeter	Area
Squash		
Pumpkin		
Beans		
Potatoes		
Corn		
Entire Field		

Extension: a) In this field scenario, is x a variable or an unknown quantity? _____

b) If it is variable, explain. If it is an unknown quantity, use equivalent lengths to find x.

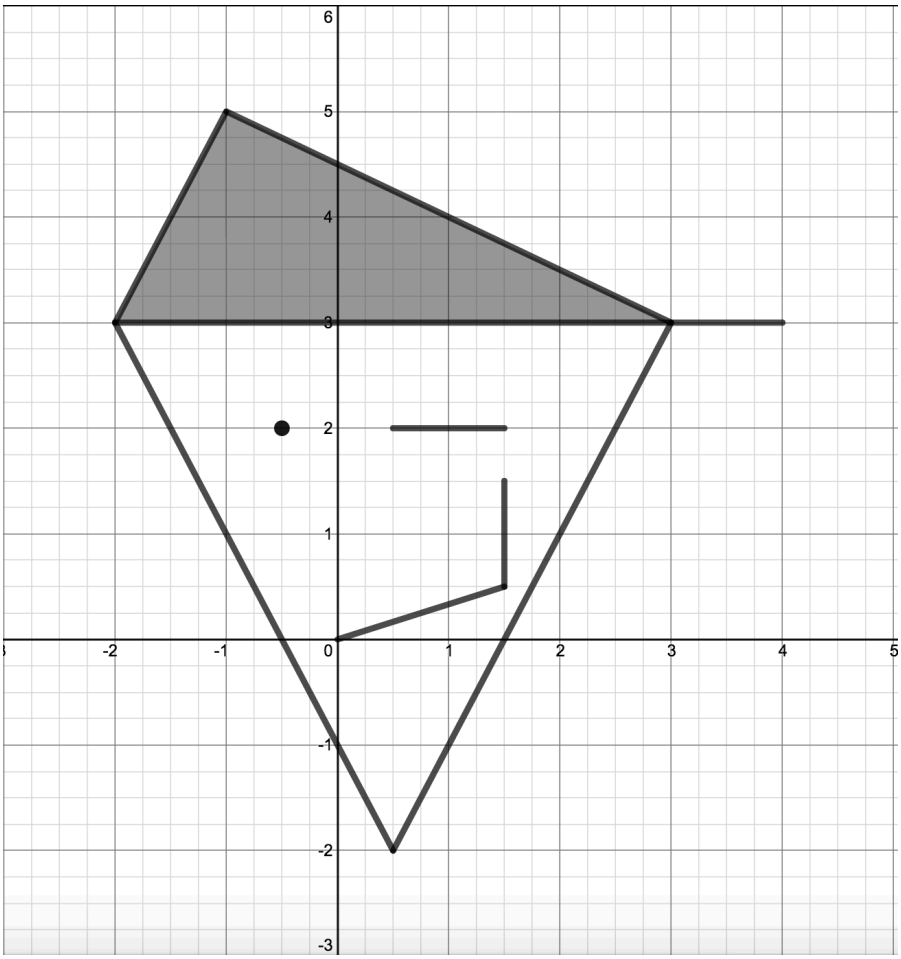
TVUSD **Name _____**
Algebra 1

Winking Boy

Below is the figure known as Winking Boy. Using graphing software, reproduce:

- **Winking Boy 1:** With equations only (no shading)
- **Winking Boy 2**: With inequalities, also (shading included)

Record your results on the backside.



Winking Boy 1

Equations & Points

1. _____
2. _____
3. _____
4. _____
5 _____
6. _____
7. _____
8. _____
9. _____

Domain and Range Restrictions

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Winking Boy 2

Equations, Inequalities & Points

1. _____
2. _____
3. _____
4. _____
5 _____
6. _____
7. _____
8. _____
9. _____

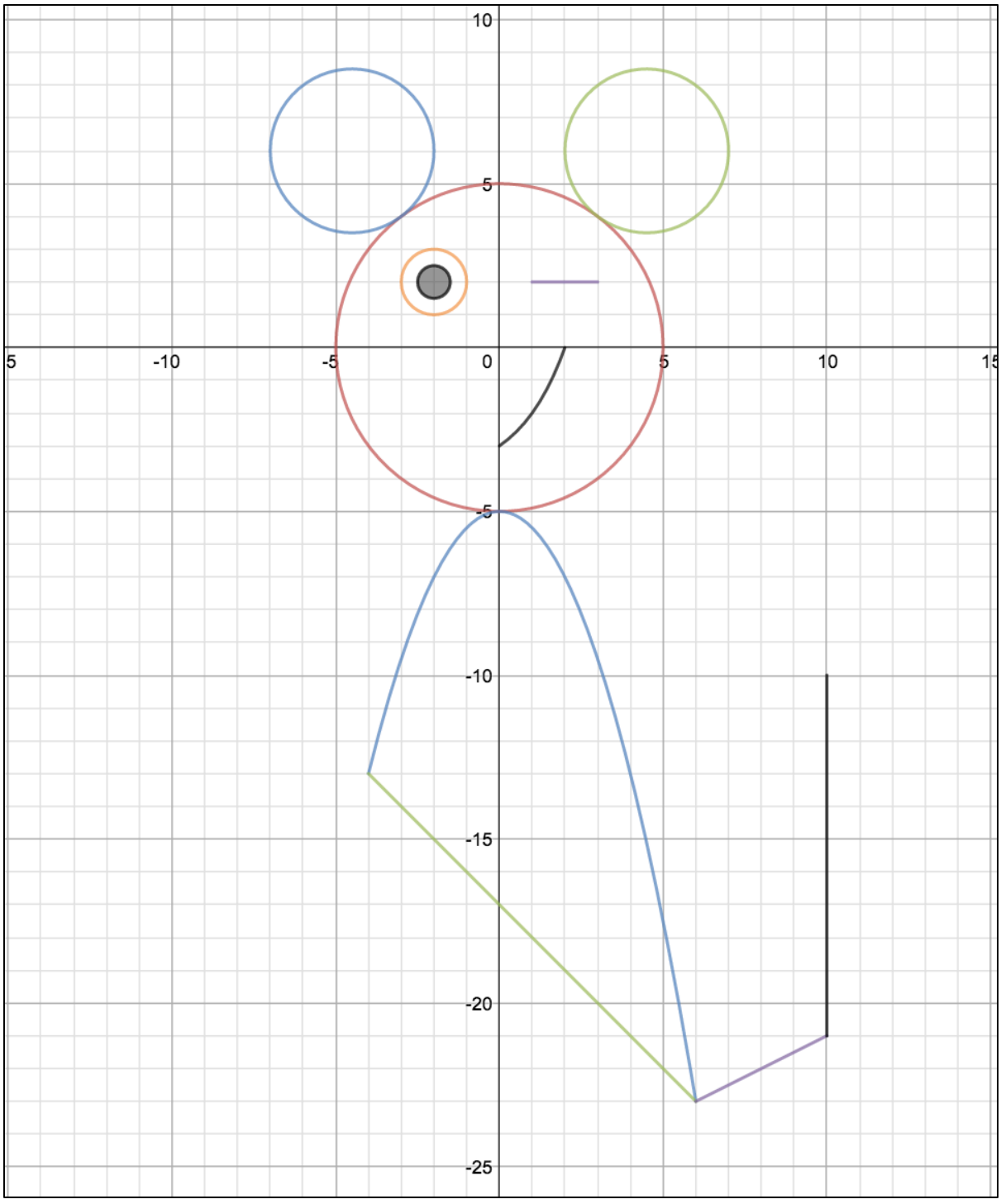
Domain and Range Restrictions

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Geometry **Name** _____

Des-Mouse

Using graphing software, reproduce the figure known as Des-Mouse. Record your results on the backside.



Des-Mouse

Equations & Inequalities	Domain and Range Restrictions
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5 _____	5. _____
6. _____	6. _____
7. _____	7. _____
8. _____	8. _____
9. _____	9. _____
10. _____	10. _____
11. _____	11. _____

Algebra 2 Name _____

Optimum Bait

My brother Matt owns Optimum Bait Company. Optimum Bait Company manufactures fishing lures. The monthly cost to run the factory is $4200 and the cost of producing each lure is an additional $0.25 per lure.

If he produces 1000 lures in one month, what is the average production cost per lure?

Create a function, C(x), that models the average production cost per lure.

Calculate the average production cost per lure if he produces 4000 lures in one month? 8000 lures? 12000 lures? 420000 lures?

As he produces more lures what price does the average cost of production approach? Why?

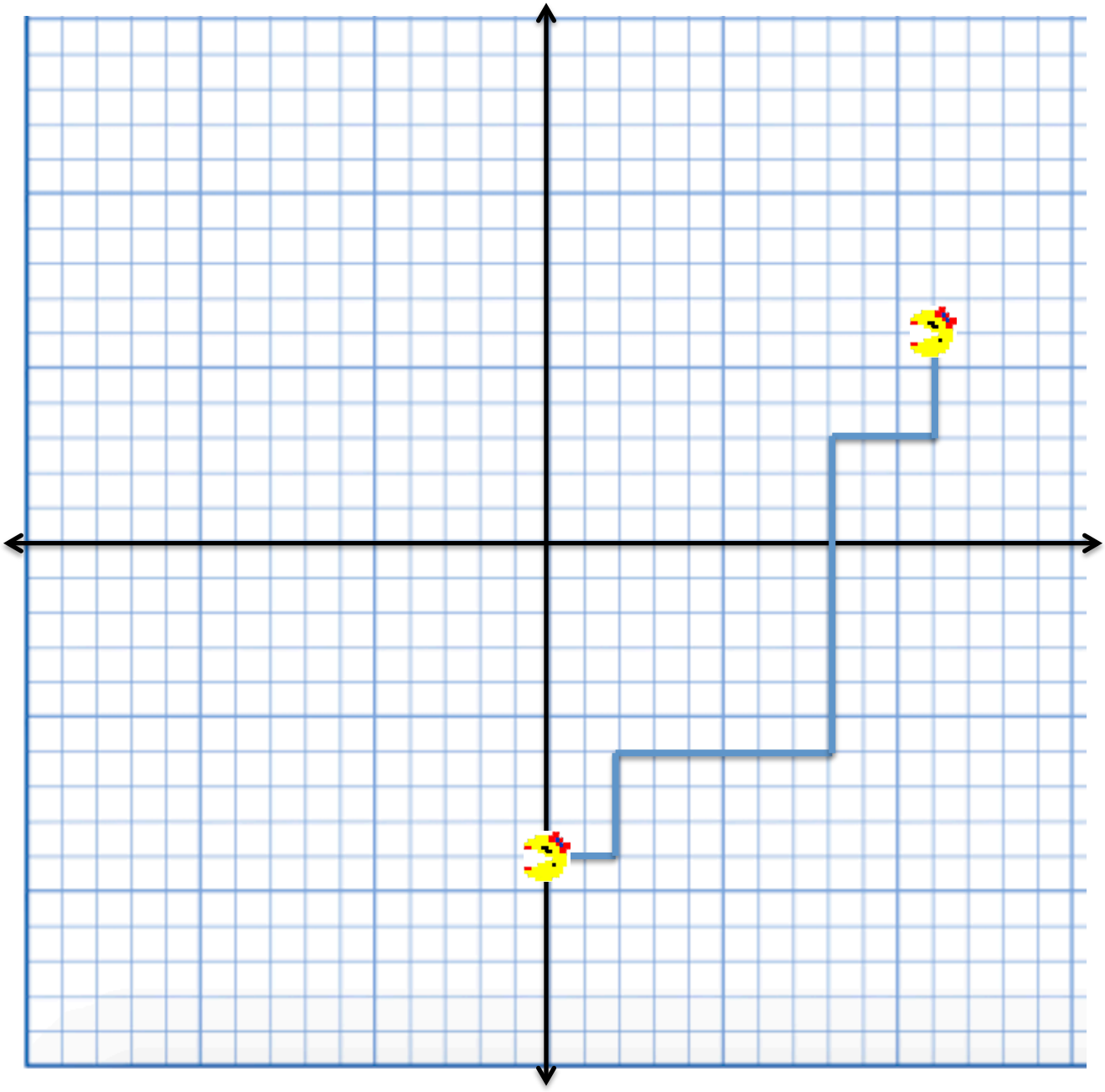
If he wants the average cost of production to be $1, how many lures would he have to produce in one month?

If he wants to make a profit of at least $4000 per month, what is the minimum number of lures he would have to produce if he sells every lure he produces for $4?

TVUSD
Geometry

Name _____

Ms Pac Man



http://bit.ly/MsPac

Ms Pac Man

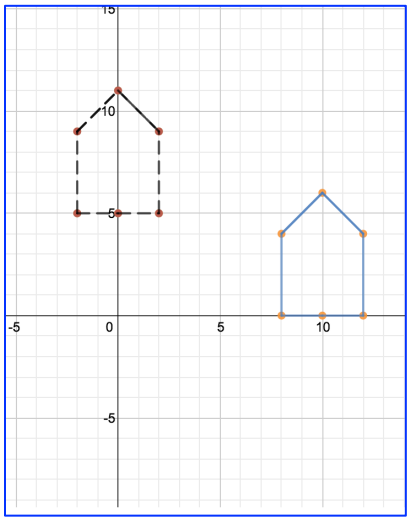
Description	Rule
1. Start at (0, -9)	1. _____
2. Reflect across x = _____	2. _____
3. _____	3. _____
4. _____	4. _____
5 _____	5. _____
6. _____	6. _____
7. _____	7. _____
8. _____	8. _____
9. _____	9. _____
10. _____	10. _____
11. _____	11. _____
12. _____	12. _____
13. _____	13. _____
14. _____	14. _____
_____	_____

TVUSD
Geometry

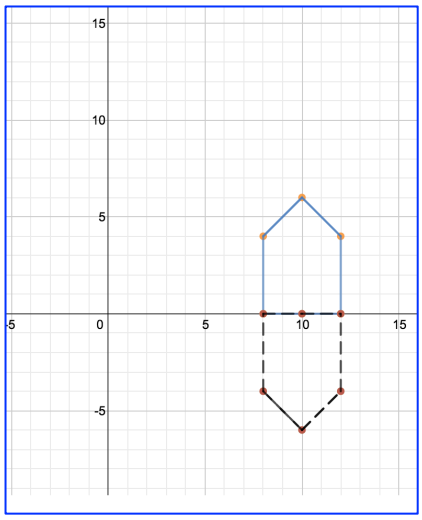
Name _____

Bend the Rules ... of Transformations
Discovery

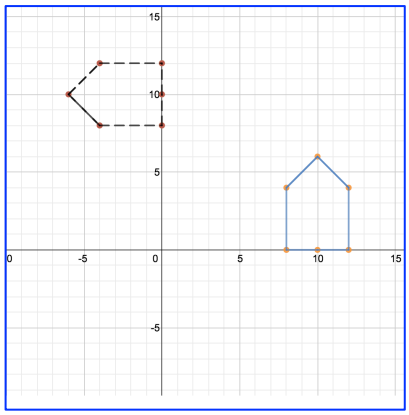
http://mathmistakes.org/complex/rules.html



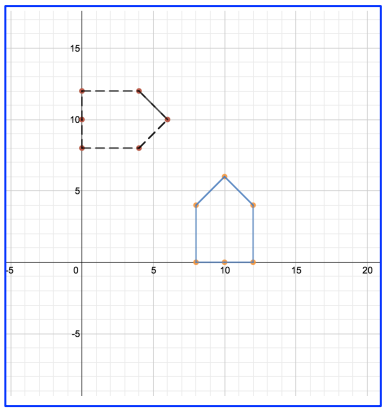
$(x,y) \mapsto (\square, \square)$



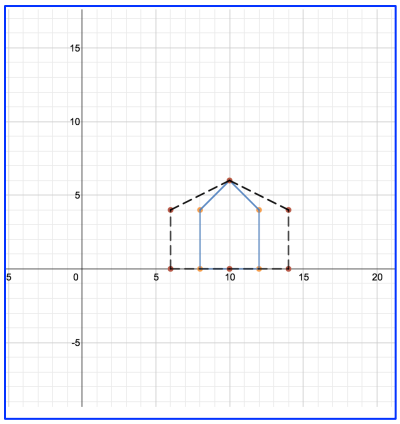
$(x,y) \mapsto (\square, \square)$



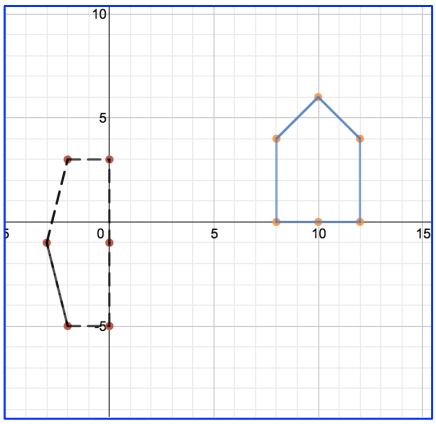
$(x,y) \mapsto (\square, \square)$



$(x,y) \mapsto (\square, \square)$



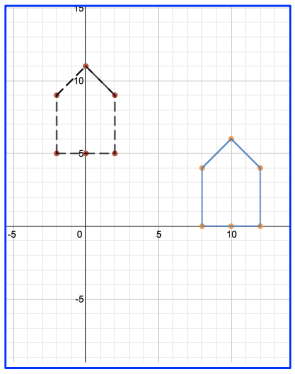
$(x,y) \mapsto (\square, \square)$



$(x,y) \mapsto (\square, \square)$

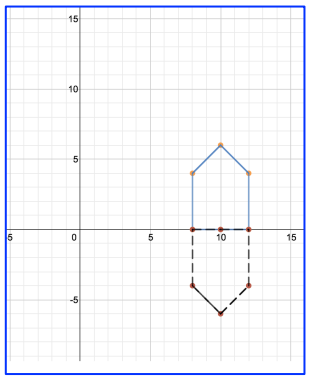
Bend the Rules … of Transformations

Generalizations



Type: _____

General Rule: (x, y) -> (,)



Type: _____

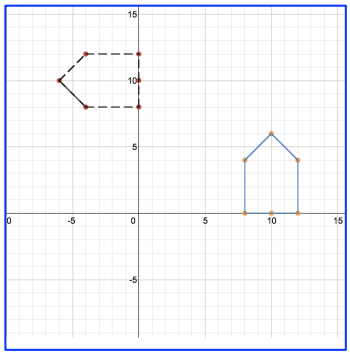
General Rule for a:

_____over the x-axis:

(x, y) -> (,)

_____over the y-axis:

(x, y) -> (,)



Type: _____

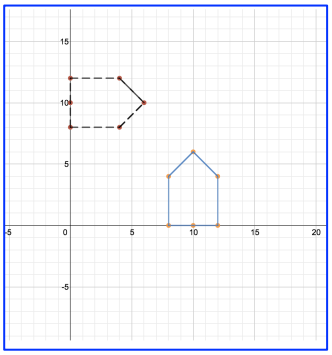
General Rule for a:

90° _____clockwise:

(x, y) -> (,)

90°_____ counterclockwise:

(x, y) -> (,)



Type: _____

General Rule for a:

_____over the line y = x:

(x, y) -> (,)

_____over the line y = -x:

(x, y) -> (,)

The Clothesline

Name: _____
Date: _____

For each set, record the given values, expressions or drawings. After the discussion of their placement on the clothesline, record them on the number line.

1. _____, _____, _____

2. _____, _____, _____

3. _____, _____, _____