Unit 6 Notes

Transformations and Angle Relationships

Name: _____

Tentative Schedule

Day	Classwork	Assignment
Mon. 1/26	Test #5	Watch Video #6.2 and Complete Notes 6.2 Reflections – page 5
Tues. 1/27 Wed. 1/28	P.S. #6.2 – Reflections	Watch Video #6.3 and Complete Notes 6.3 Dilations – page 7
Thurs. 1/29	P.S. #6.3 – Dilations	Watch Video #6.4 and Complete Notes 6.4 Translations – page 8
Fri. 1/30 Mon. 2/2	P.S. #6.4 – Translations	Watch Video #6.5 and Complete Notes 6.5 Rotations – page 9
Tues. 2/3	P.S. #6.5a – Rotations	Finish P.S. #6.5a - Rotations
Wed. 2/4 Thurs. 2/5	Symmetries P.S. #6.1 – Symmetries	P.S. #6.5b – Mixed Transformations
Fri. 2/6	**Quiz #6** P.S. #6.5c – Review	Finish P.S. #6.5c – Review
Mon. 2/9 Tues. 2/10	Begin Angle Relationships Catch-up Day	Watch Video #6.6 and Complete Notes 6.6 Angle Relationships (Part 2) – page 12
Wed. 2/11	P.S. #6.6 – Angle Relationships	Video #6.7 and Complete Notes 6.7 Similarity vs. Congruence – page 13
Thurs. 2/12 Fri. 2/13	P.S. #6.7 – Similarity vs. Congruence	Catch-up on checklist
Mon. 2/23	Identifying Transformations	P.S. #6.8 – Identifying Transformations
Tues. 2/24 Wed. 2/25	**Review for Test #6**	Review for Test #6
Thurs. 2/26	**Test #6**	Video #7.1

Notes 6.1 – Symmetries

There are four different transformations:

1.) _____

2.) _____

3.) _____

4.) _____

Line Symmetry:

Letters that have line symmetry:

Point Symmetry: Point symmetry exists when a figure is built around a _____ _____ called the center of the figure. For every point in the _____, there is another point found at the same distance from the center directly _____ it.

How can you tell if a figure has point symmetry?

Letters that have point symmetry:

Transformation Rules Sheet

Line Reflections:

$r_{x-axis}(x,y) = (x,-y)$
$r_{y-axis}(x,y) = (-x,y)$
$r_{y=x}(x,y) = (y,x)$
$r_{y=-x}(x,y) = (-y,-x)$

Pre-image and image are **congruent** and **similar.**
- Congruent sides
- Congruent angles

Point Reflection:

$R_{180°}(x,y) = (-x,-y)$

Pre-image and image are **congruent** and **similar.**
- Congruent sides
- Congruent angles

Rotations:

$R_{90°}(x,y) = (-y,x)$
$R_{180°}(x,y) = (-x,-y)$
$R_{270°}(x,y) = (y,-x)$
$R_{-90°}(x,y) = (y,-x)$

Pre-image and image are **congruent** and **similar.**
- Congruent sides
- Congruent angles

Translation:

$T_{a,b}(x,y) = (x+a, y+b)$

Pre-image and image are **congruent** and **similar.**
- Congruent sides
- Congruent angles

Dilation:

$D_k(x,y) = (kx,ky)$

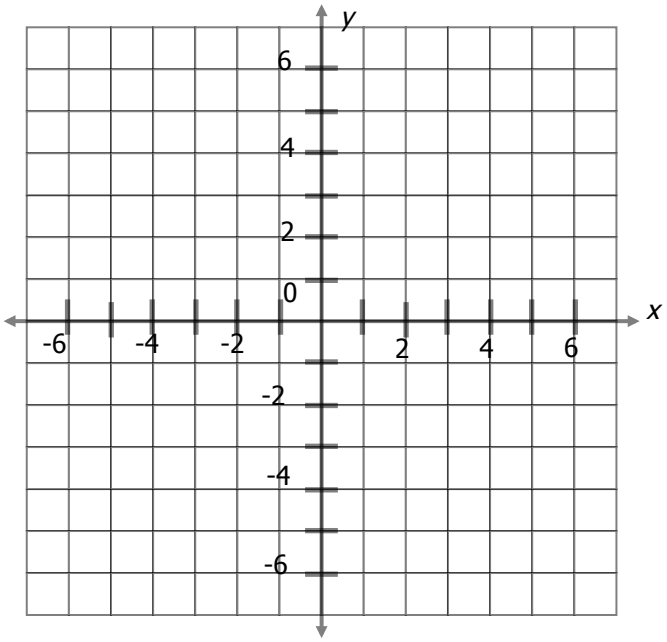
Pre-image and image are **ONLY similar.**
- **Proportional** sides
- **Congruent** angles

Notes 6.2 - Reflections

Reflection:

1.) Graph point A(3,5) on the set of axes to the right.

2.) Graph the image of A after a reflection in the y-axis. State the coordinates of the image.



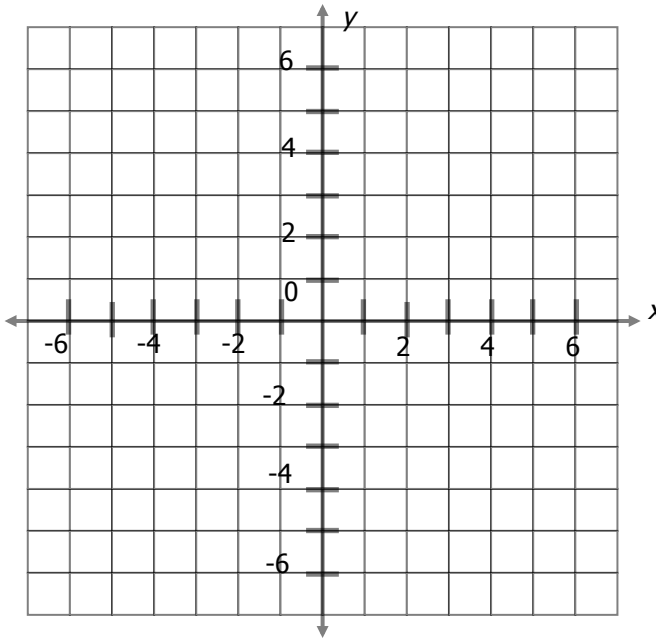
3.) Graph point B(6,2) on the set of axes to the right.

4.) Graph the image of B after a reflection in the x-axis. State the coordinates of the image.

What do you notice?

Before Reflection (x,y)	→	**After Reflection in the x-axis:**
		After Reflection in the y-axis:
		After Reflection in the line $y = x$

5.) Given triangle *ABC* with coordinates *A*(3,1), *B*(5,3), *C*(6,1). Reflect triangle *ABC* over the line $y = x$. State the new coordinates.



Properties of Reflections

a.) _____

b.) _____

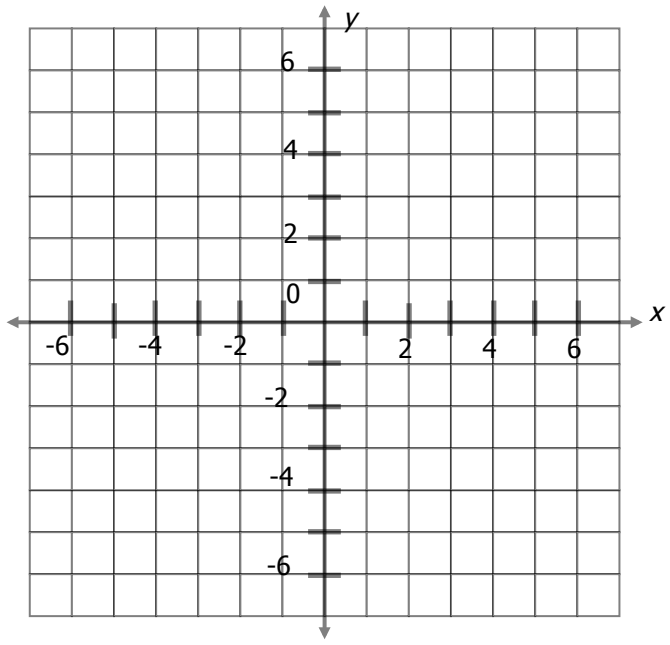
c.) _____

Notes 6.3 - Dilations

What is a dilation?

How do you do a dilation?

1.) Graph rectangle *OLEG* *O*(-3,-3), *L*(-3,2), *E*(1,2), *G*(1,-3). Graph *O'L'E'G'* after a dilation with scale factor 2.



Properties of Dilations

a.) _____

b.) _____

c.) _____

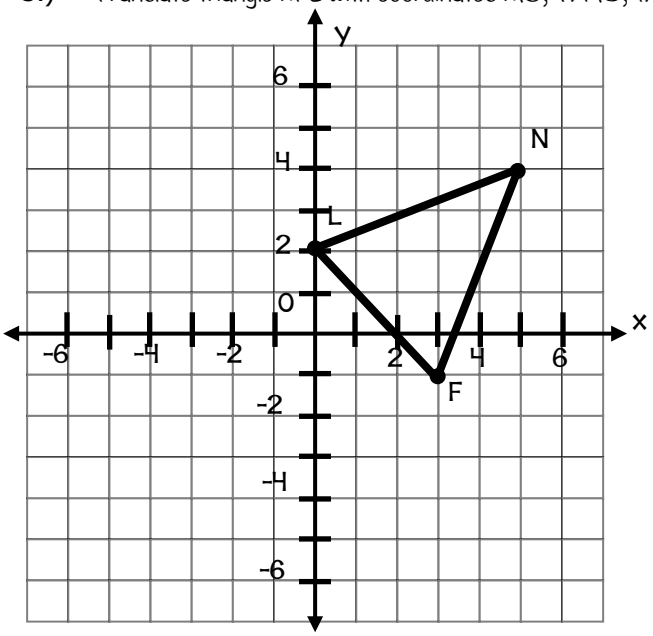
Notes 6.4 - Translations

1.) **Translation:** A translation _____ the same figure in the same _____.

2.) How would the following translation affect a coordinate?

Translation	X-Coordinate	Y-Coordinate
Move to 8 units to the right		
Move 3 units to the left		
Move 9 units up		
Move 7 units down		

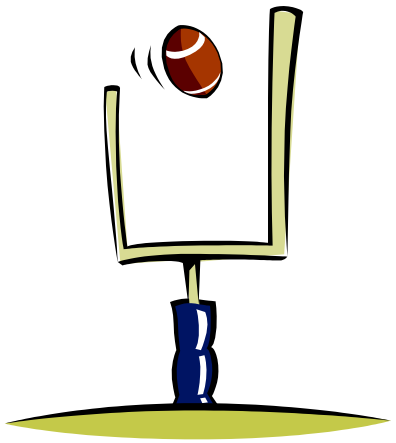
3.) Translate triangle NFL with coordinates N(5,4) F(3,-1) and L(0,2) 2 units to the right and 2 units down.



N' _____

F' _____

L' _____



4.) Two notations for left five, up six: _____ _____

5.) Two notations for right two, down eleven: _____ _____

6.) General form for a translation: _____ _____

Properties of Translations

a.) _____

b.) _____

c.) _____

Notes 6.5 - Rotations

Rotation:

Which way is clockwise?

Which way is counterclockwise?

Steps to graphing rotations (multiples of 90°):

1.) Draw the original figure.

2.) Turn the paper.

Do NOT graph the coordinates when the paper is turned!!!

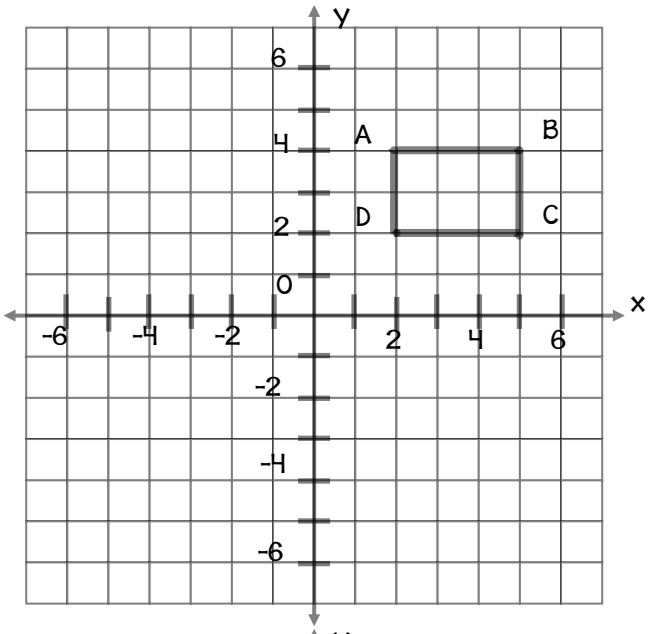
3.) Determine what the new coordinates are while the paper is turned.

Do NOT graph the coordinates when the paper is turned!!!

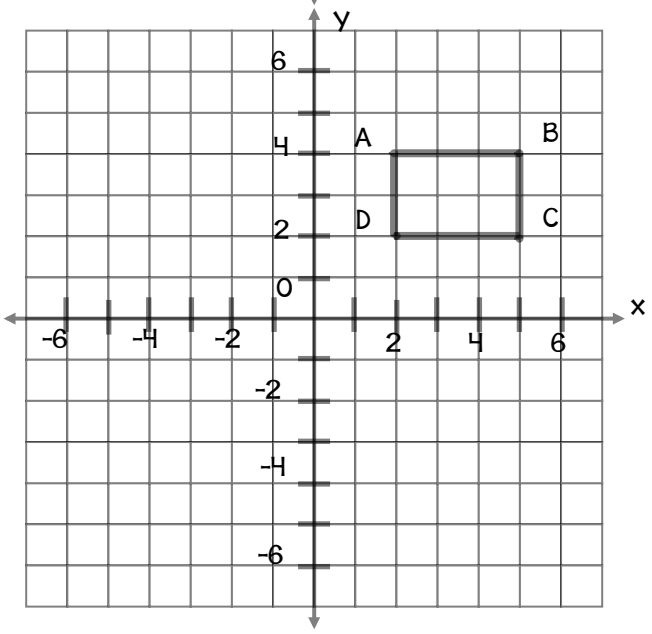
4.) Turnthe paper back.

5.) Graph the new coordinates.

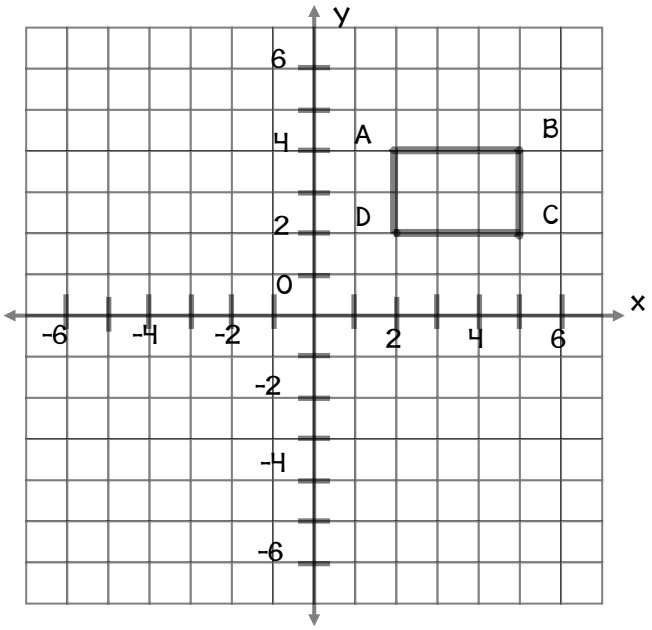
1.) Given rectangle ABCD, with coordinates A (2,4), B(5,4), C(5,2), and D(2,2), find the new rectangle A'B'C'D' after a 90° clockwise rotation.



2.) Given rectangle ABCD, with coordinates A (2,4), B(5,4), C(5,2), and D(2,2), find the new rectangle A'B'C'D' after a 180° clockwise rotation.



3.) Given rectangle ABCD, with coordinates A (2,4), B(5,4), C(5,2), and D(2,2), find the new rectangle A'B'C'D' after a 270° clockwise rotation.



Summary

Rotation	(x,y)→

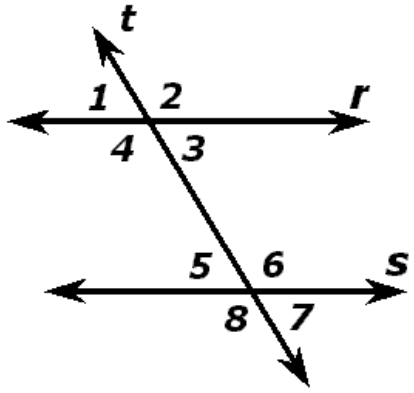
Properties of rotations:

a. _____

b. _____

c. _____

Notes 6.6 - Angle Relationships

Word	Definition	Example
Parallel Lines	Lines that _____ _____. Notation: r _____ s t is called the _____	
Exterior Angles	Angles on the _____ of the _____ lines	
Interior Angles	Angles on the _____ of the _____ lines	
*Alternate Exterior Angles**	Angles on the _____ of the _____ lines and on _____ sides of the transversal	
*Alternate Interior Angles**	Angles on the _____ of the _____ lines and on _____ sides of the transversal	
*Corresponding Angles**	Angles that are in the same _____ when the parallel lines are placed _____.	
*Vertical Angles**	Angles that are _____ or _____ from each other	

*Angles that are **congruent** to each other.

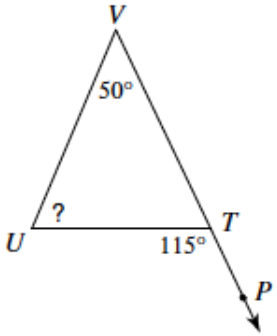
Angles on parallel lines that are **not congruent are **supplementary** (add up to _____).

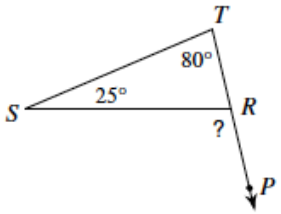
1.) What do the angles in a triangle add up to?

2.) If a triangle has two angles with measures of 39° and 81°, what is the measure of the third angle?

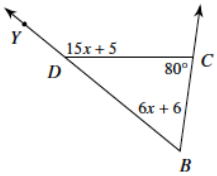
3.) In ΔABC, $m\angle A = 4x$, $m\angle B = 3x+1$, and $m\angle C = x-13$. Find the value of x and the measure of each angle.

4.) In each triangle below, find the missing angle.





5.) 18) Find $m\angle YDC$.



Notes 6.7 - Similarity vs. Congruence

1.) What is the difference between congruency and similarity?

2.) What requirements are there for shapes to be similar?

3.) $\Delta ABC \sim \Delta DEF$. Answer the following questions.

a. Draw a picture of the two triangles.

b. Which angle corresponds to $\angle A$? _____

c. Which angle corresponds to $\angle B$? _____

d. Which angle corresponds to $\angle C$? _____

e. Which side corresponds to AB? _____

f. Which side corresponds to BC? _____

g. Which side corresponds to AC? _____

h. Fill in the missing information in the chart below.

$AB = 5$	$m\angle A = 31$	$DE =$ _____	$m\angle D =$ _____
$BC = 8$	$m\angle B =$ _____	$EF = 5$	$m\angle E =$ _____
$AC = 12$	$m\angle C =$ _____	$DF =$ _____	$m\angle F = 73$

i. What is the scale factor? _____

4.) Which transformation will result in a figure that is similar, but not congruent, to the original figure? Explain your reasoning.