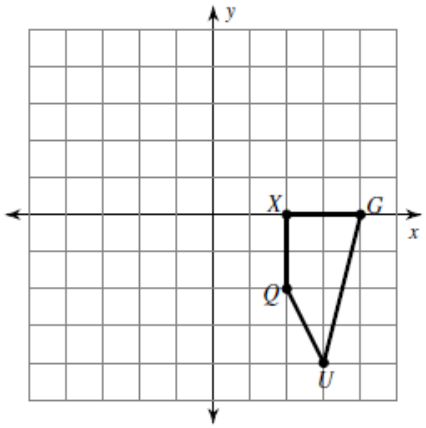
## Day 1 Homework Part 1

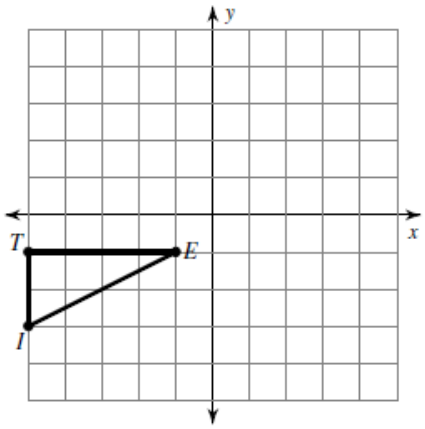
**Graph the image of the figure using the transformation given and write the algebraic rule.**

1) translation: 1 unit left



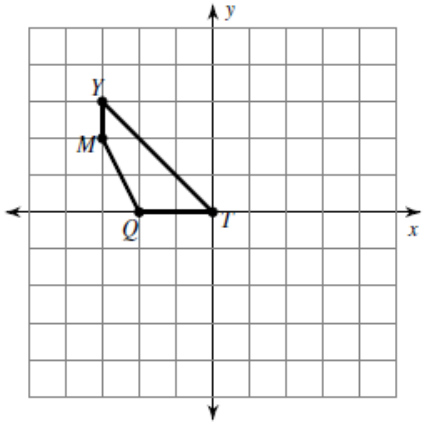

Algebraic Rule:

2) translation: 1 unit right and 2 units down



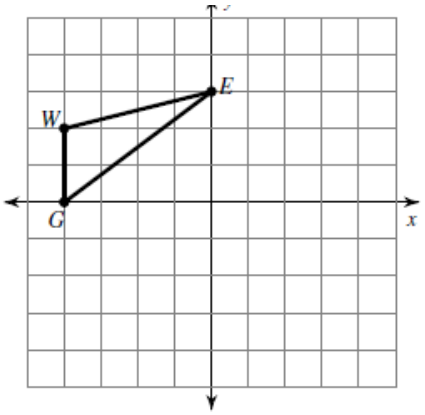

Algebraic Rule:

3) translation: 3 units right



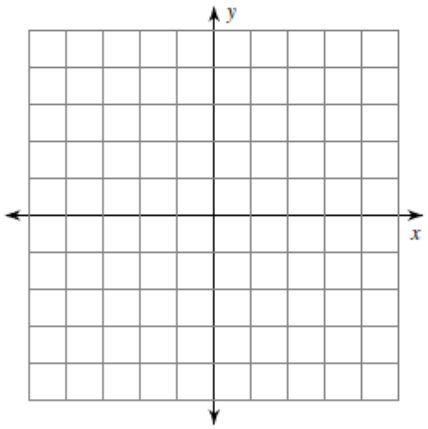

Algebraic Rule:

4) translation: < 1, -2 >



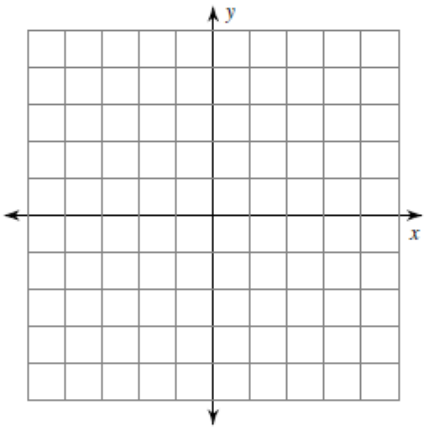

Algebraic Rule:

5) translation: 5 units up
$U(-3, -4), M(-1, -1), L(-2, -5)$




Algebraic Rule:

6) translation: < 0, 3 >
$R(-4, -3), D(-4, 0), L(0, 0), F(0, -3)$




Algebraic Rule:

**Find the coordinates of the vertices of each figure after the given transformation and write the algebraic rule.**

7) Translation: 2 units left and 1 unit down
Q(0, -1), D(-2, 2), V(2, 4), J(3, 0)
Vertices:

Algebraic Rule:

8) Translation: 2 units down
D(-4, 1), A(-2, 5), S(-1, 4), N(-1, 2)
Vertices:

Algebraic Rule:

9) Translation: < -4, 4 >
J(-1, -2), A(-1, 0), N(3, -3)
Vertices:

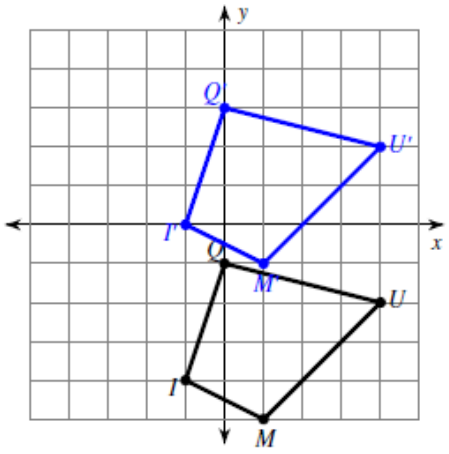
Algebraic Rule:

10) Translation: 3 units right and 4 units up
Z(-4, -3), I(-2, -2), V(-2, -4)
Vertices:

Algebraic Rule:

**Write a specific description of each transformation and give the algebraic rule.**

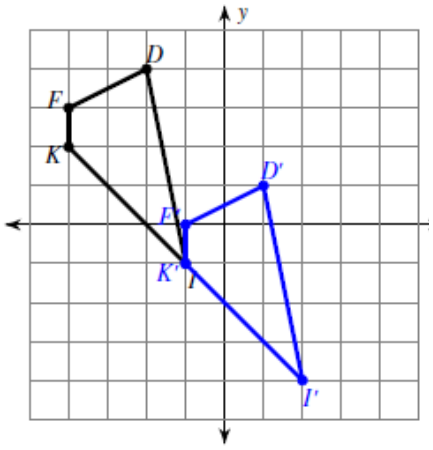
11)




Description:

Algebraic Rule:

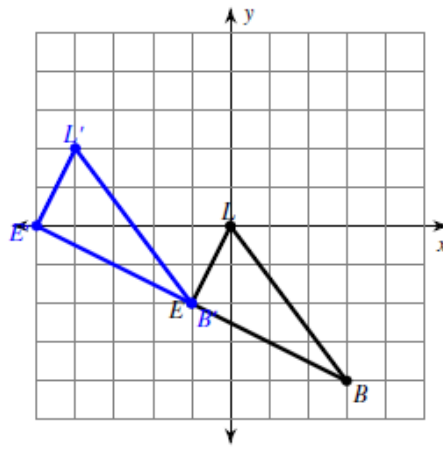
12)




Description:

Algebraic Rule:

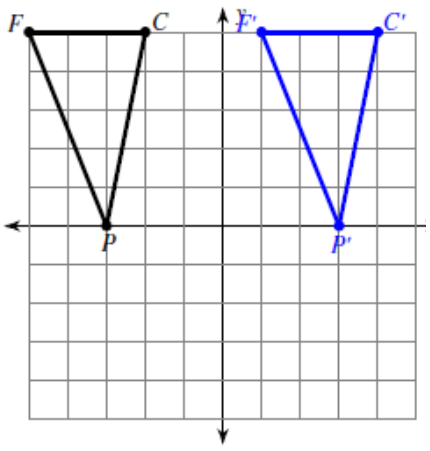
13)




Description:

Algebraic Rule:

14)




Description:

Algebraic Rule:

## Day 1 Homework Part 2: Geometry Review

**1. In the segment below, another name for $\overline{AB}$ is _____**

**2. Using the segment below, the notation AC means**

_____

_____


**3. Segment Addition Postulate:**

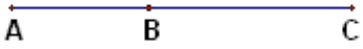
_____

In the segment below,

AB = 2*x* + 9, BC = 4*x* – 7, AC = 38

What does *x* equal?

*x* = _____




**4. Definition of a Midpoint:**

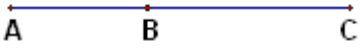
_____

In the segment below,
B is the midpoint of AC.

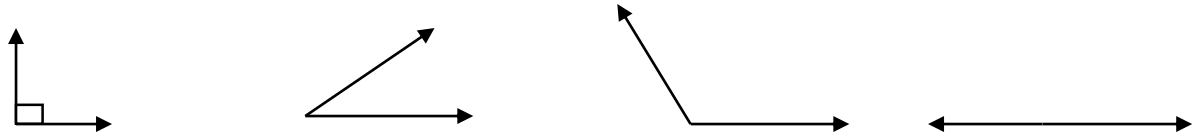
AB = 4*x* + 2, BC = 6*x* - 8

What do *x* and AC equal?

*x* = _____ AC = _____




**5. Classify the following angles:**



**6. Angle Addition Postulate:**

_____

$m\angle 1 = 7x - 2$

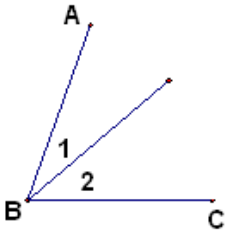
$m\angle 2 = 5x + 5$

$m\angle ABC = 75°$

What is *x* equal to?

$x =$ _____

SIDE NOTE: m∠1 is the shortcut way of writing "the measure of angle 1." It's like math texting – you write LOL instead of "laughing out loud," math people write m∠1 instead of "the measure of angle 1."




**7. Definition of an Angle Bisector: _____**

_____

$\overrightarrow{BD}$ bisects $\angle ABC$

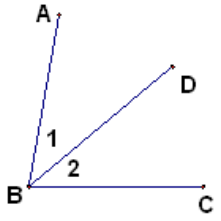
$m\angle 1 = 5x - 12$

$m\angle 2 = 2x + 21$

What is *x* and $m\angle ABC$ ?

$x =$ _____

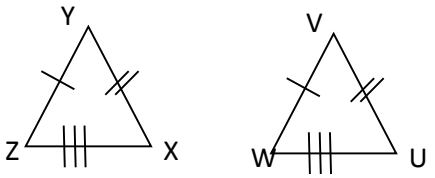
$m\angle ABC =$ _____




8. **Congruent ( ≅ )** means "the same size and shape." **Equal ( = )** refers to numerical values. Fill in the following blanks with ≅ or = . Use the diagrams at the right to assist you.

a. 4 + 6 _____ 10

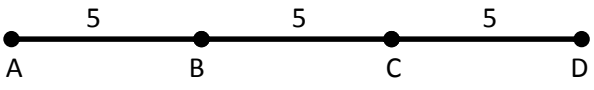
b. Triangle ZYX _____ Triangle WVU
Note: this is typically written
Δ ZYX _____ Δ WVU




c. 4x + 8 _____ 4(x + 2)

d. AB_____CD

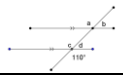
e. $\overline{AB}$ _____ $\overline{CD}$



9. Given what you know about right angles and straight angles, solve for the variables:



10. The angles around parallel lines have some really interesting properties…can you figure them out?
Find the values of a, b, c, and d.
Side Note: The little arrows on the two lines are a Geometry notation
for saying "these lines are parallel."



11. Solve for the missing variables.



**If U is between T and B, find the value of x and the lengths of the segments. (Hint: Draw a picture for each problem with the given information and then write the equation to solve.)**

12. TU = 2x, UB = 3x + 1, TB = 21

x = _____

TU = _____

UB = _____

13. TU = 4x-1, UB = 2x -1, TB = 5x

x = _____

TU = _____

UB = _____

TB = _____

**For 14-15, suppose $\overline{RS}$ is congruent to $\overline{MN}$. For each set, solve for x, and find the length of each segment.**

14. RS = 3x + 17, MN = 7x – 15

x = _____

RS = ____

MN = ____

15. RS = x + 10, MN = 2x + 4

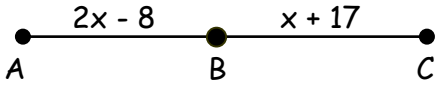
x = _____

RS = _____

MN = ____

**For 16-17, let $\overline{AB} \cong \overline{BC}$.**

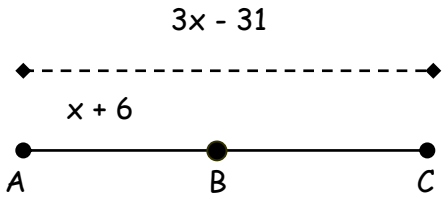
16.




x = _____ AB = _____

BC = _____ AC = _____

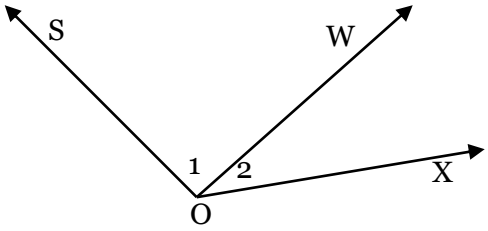
17.



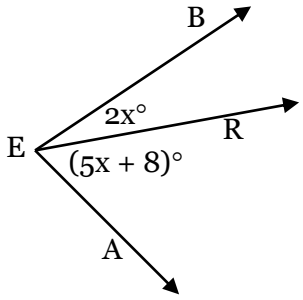

x = _____ AB = _____

BC = _____ AC = _____

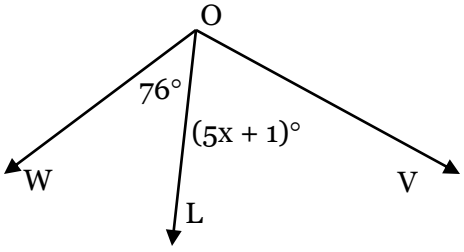
18. m∠SOX = 160
m∠1 = x + 1
m∠2 = 3x – 1
Find m∠2




19. m∠BEA = 71. Find m∠REA.



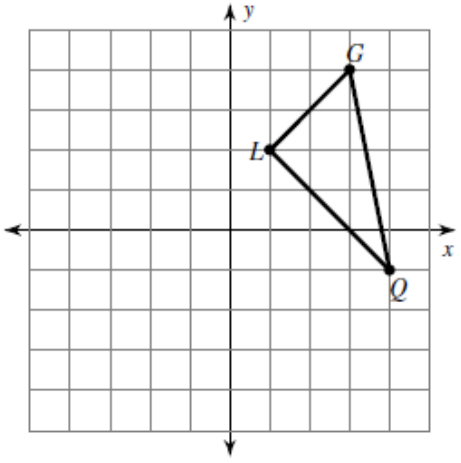

20. m∠WOV = 12x. Find m∠LOV.



## Day 2 Homework Part 1

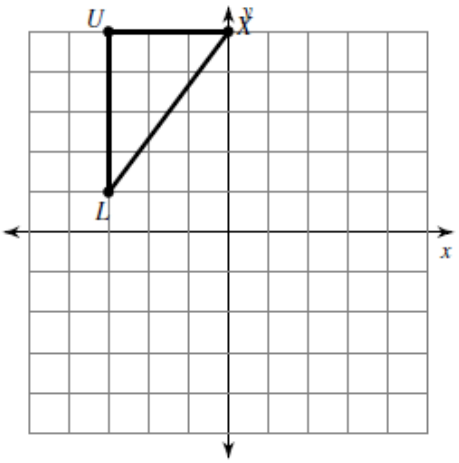
**Graph the image using the transformation given and give the algebraic rule as requested.**

1) reflection across the x-axis

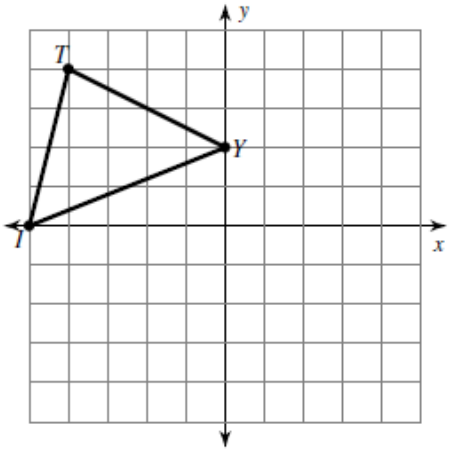



Algebraic Rule:

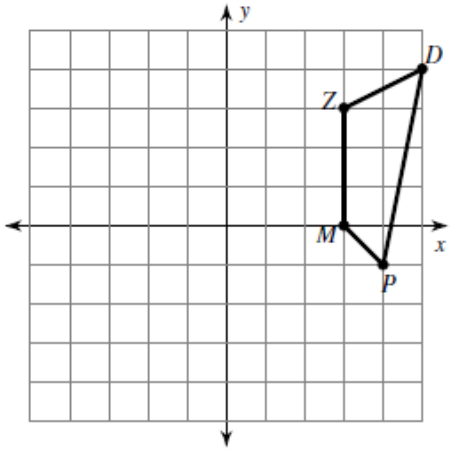
2) reflection across $y = 3$




3) reflection across $y = 1$

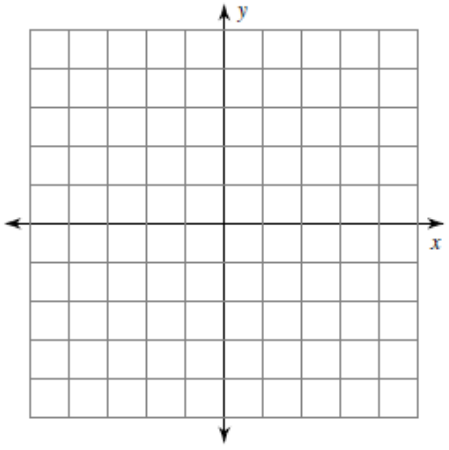



4) reflection across the x-axis



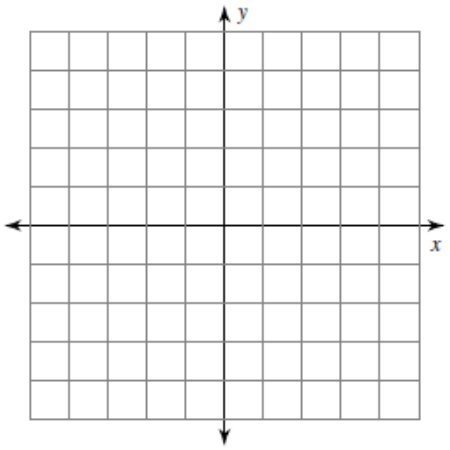

Algebraic Rule:

5) reflection across the x-axis
$T(2, 2), C(2, 5), Z(5, 4), F(5, 0)$




Algebraic Rule:

6) reflection across $y = -2$
$H(-1, -5), M(-1, -4), B(1, -2), C(3, -3)$



**Find the coordinates of the vertices of each figure after the given transformation and give the algebraic rule, as requested.** ***(Hint:*** **Using graph paper may help on these!)**

7) Reflection across the x-axis
K(1, -1), N(4, 0), Q(4, -4)

Algebraic Rule:

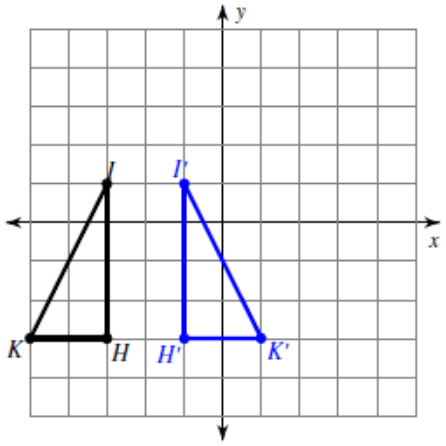
8) Reflection across y = -1
R(-3, -5), N(-4, 0), V(-2, -1), E(0, -4)

9) Reflection across x = 3
F(2, 2), W(2, 5), K(3, 2)

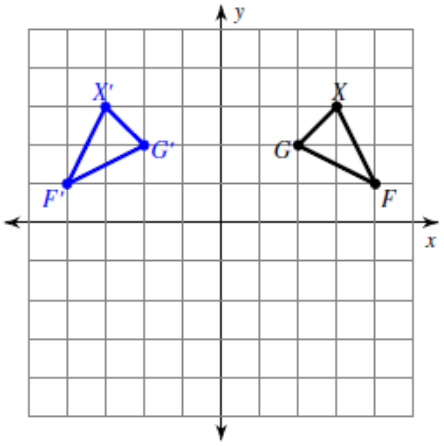
10) Reflection across x = -1
V(-3, -1), Z(-3, 2), G(-1, 3), M(1, 1)

**Write a description of each transformation and give the algebraic rule, as requested.**

11)

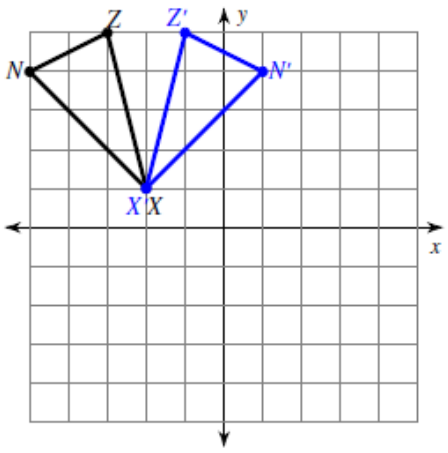



12)

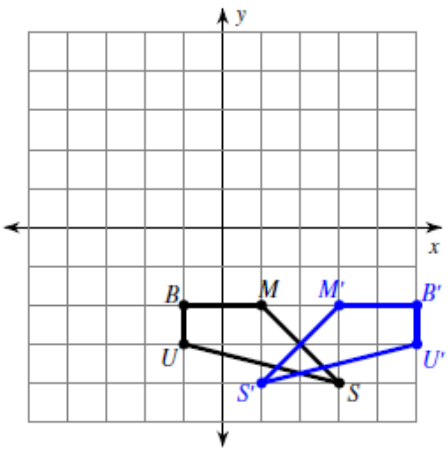



Algebraic Rule:

13)



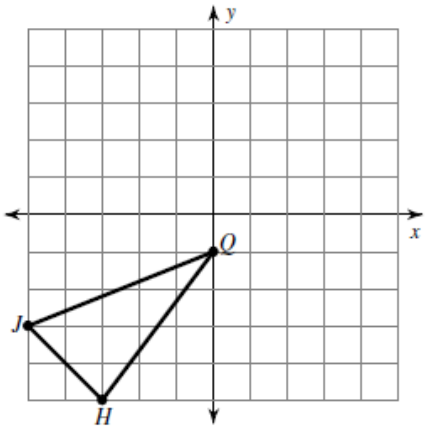

14)



## Day 3 – Homework Part 1

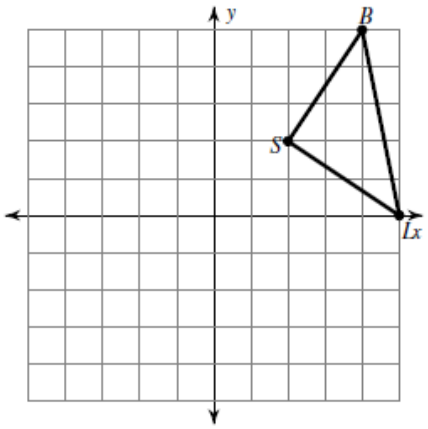
**Graph the image of the figure using the transformation given. Also, give the <u>coordinates</u> of the image and the algebraic rule for the transformation.**

1) rotation 180° about the origin



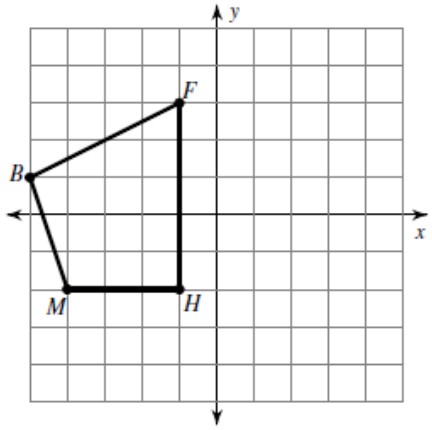

Algebraic Rule:

2) rotation 90° counterclockwise about the origin



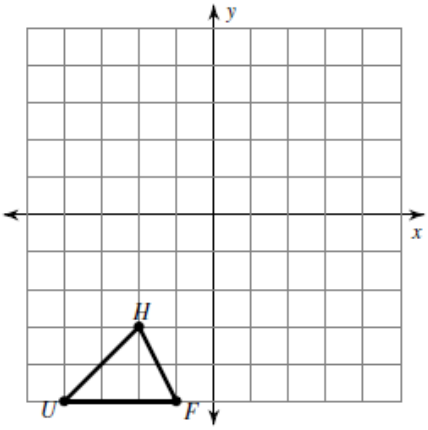

Algebraic Rule:

3) rotation 90° clockwise about the origin



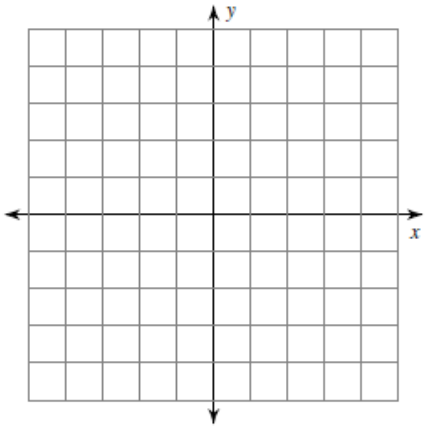

Algebraic Rule:

4) rotation 180° about the origin



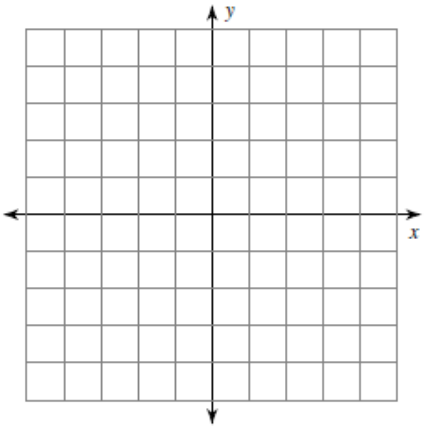

Algebraic Rule:

5) rotation 90° clockwise about the origin
$U(1, -2)$, $W(0, 2)$, $K(3, 2)$, $G(3, -3)$




Algebraic Rule:

6) rotation 180° about the origin
$V(2, 0)$, $S(1, 3)$, $G(5, 0)$




Algebraic Rule:

**Identify the coordinates of the vertices for each figure after the given transformation. Also, give the algebraic rule for each transformation. Use proper notation.**

7) rotation 180° about the origin
Z(-1, -5), K(-1, 0), C(1, 1), N(3, -2)
Vertices:

Algebraic Rule:

8) rotation 180° about the origin
L(1, 3), Z(5, 5), F(4, 2)
Vertices:

Algebraic Rule:

9) rotation 90° clockwise about the origin
S(1, -4), W(1, 0), J(3, -4)
Vertices:

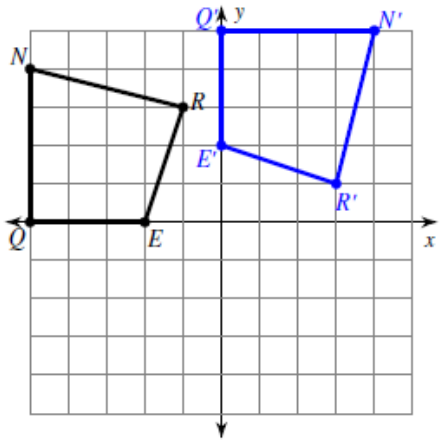
Algebraic Rule:

10) rotation 180° about the origin
V(-5, -3), A(-3, 1), G(0, -3)
Vertices:

Algebraic Rule:

**Write a description of each transformation AND give the algebraic rule.**

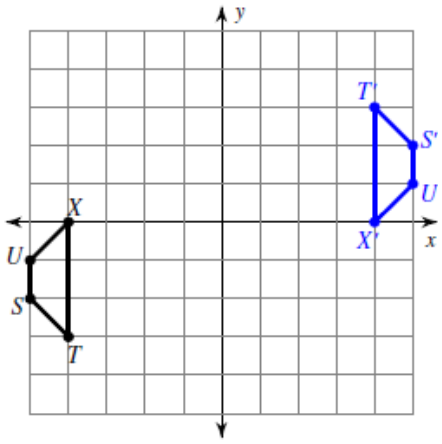
11)




Description:

Algebraic Rule:

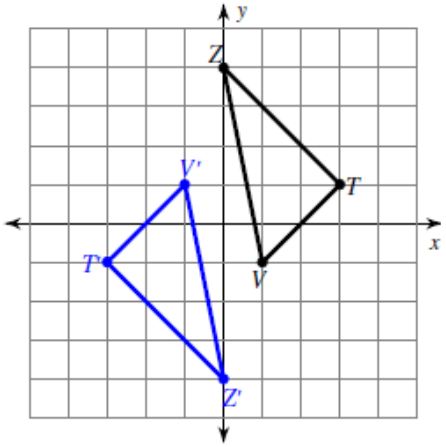
12)




Description:

Algebraic Rule:

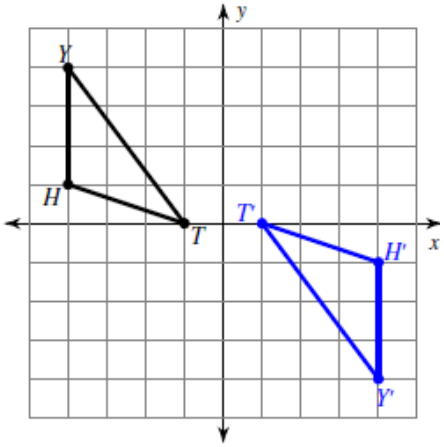
13)




Description:

Algebraic Rule:

14)




Description:

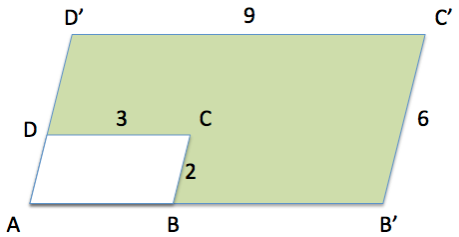
Algebraic Rule:

## Day 4 – Homework Part 1

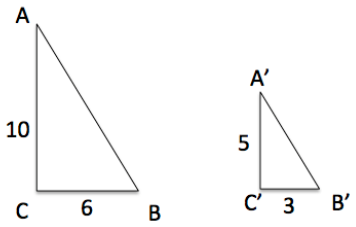
1. Describe the transformation given by rule $(x, y) \rightarrow (3x, y)$ . Is it an "Isometry"? Why or why not?

2. Write an algebraic rule that would cause dilation by a factor of 3 and dilation by a factor of 1/2.

3. Find the scale factor of the dilation that maps ABCD to A'B'C'D'.

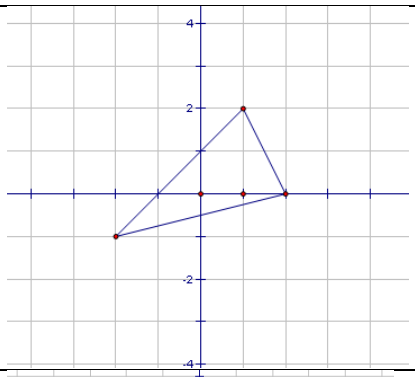



4. Find the scale factor of the dilation that maps ABC to A'B'C'.



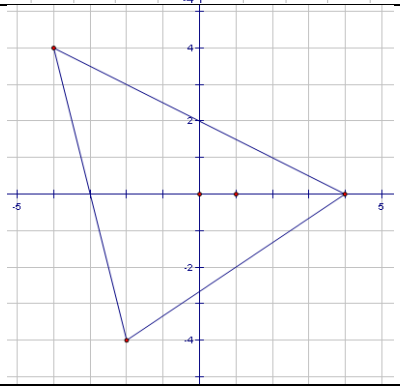

5. Graph the dilation of the object shown using a scale factor of 2.

Algebraic Rule:



6. Graph the dilation of the object shown using a scale factor of ½.

Algebraic Rule:



**Advanced:**

7. The package for a model airplane states the scale is 1:63. The length of the model is 7.6 cm. What is the length of the actual airplane?

8. Another model airplane states the scale is 1:96. The length of the real airplane is 48 feet. What is the length of the model?

# Algebra Review: Systems of Equations

**Read the following example problem about solving by the Substitution Method.**

**Example 1:**

$y = 5 - 2x$
$5x - 6y = 21$

**Solution:**

1) $5x - 6(5 - 2x) = 21$
2) $5x - 30 + 12x = 21$
3) $17x - 30 = 21$
4) $x = 3$
5) $y = 5 - 2(3) = -1$

**Steps explained here:**

1) Substitute $5 - 2x$ for y in the 2nd equation.
2) Distribute.
3) Simplify.
4) Solve by isolating x.
5) Substitute 3 for x in the first equation.

The solution is $x = 3, y = -1$ or $(3, -1)$

**Solve each system of equations by the Substitution Method.**
**Show ALL work! Use separate paper if needed.**

1. $y = 3x$
   $5x + y = 24$

2. $y = 2x + 5$
   $3x - y = 4$

3. $x = 8 + 3y$
   $2x - 5y = 8$

4. $3x + 2y = 71$
   $y = 4 + 2x$

5. $4x - 5y = 92$
   $x = 7y$

6. $y = 3x + 8$
   $x = y$

7. $8x + 3y = 26$
   $2x = y - 4$

8. $x - 7y = 13$
   $3x - 5y = 23$

9. $3x + y = 19$
   $2x - 5y = -10$

**Read the following example problem about solving by the Elimination Method.**

**Example 2:**

$3x - y = 13$
$8x + 2y = 44$

**Solution:**

1) $6x - 2y = 26$
   $8x + 2y = 44$
2) $14x = 70$
3) $x = 5$
4) $3(5) - y = 13$

**Steps explained here:**

1) Multiply the 1st equation by 2 to get the same number and opposite signs on 1 variable.
2) Add the two equations together.
3) Solve for x.
4) Substitute 5 for x in the first equation.

The solution is $x = 5, y = 2$ or $(5, 2)$

**Solve each system by Elimination. Show ALL work! Use separate paper if needed.**

10. $5x - y = 20$
    $3x + y = 12$

11. $x + 3y = 7$
    $x + 2y = 4$

12. $3x - 2y = 11$
    $3x - y = 7$

13. $7x + y = 29$
$5x + y = 21$

14. $8x - y = 17$
$6x + y = 11$

15. $9x - 2y = 50$
$6x - 2y = 32$

16. $7y = 2x + 35$
$3y = 2x + 15$

17. $2y = 3x - 1$
$2y = x + 21$

18. $19 = 5x + 2y$
$1 = 3x - 4y$

19. $u + v = 7$
$2u + v = 11$

20. $m - n = -9$
$7m + 2n = 9$

21. $3p - 5q = 6$
$2p - 4q = 4$

22. $4x - 5y = 17$
$3x + 4y = 5$

23. $2c + 6d = 14$
$\frac{1}{2}c - 3d = 8$

24. $3s + 2t = -3$
$s + 1/3t = -4$

**Solve each system of equations by using either Substitution or Elimination.**

25. $r + 4s = -8$
$3r + 2s = 6$

26. $10m - 9n = 15$
$5m - 4n = 10$

27. $3c - 7d = -3$
$2c + 6d = -34$

28. $6g - 8h = 50$
$4g + 6h = 22$

29. $2p = 7 + q$
$6p - 3q = 24$

30. $3x = -31 + 2y$
$5x + 6y = 23$

31. $3u + 5v = 6$
$2u - 4v = -7$

32. $3a - 2b = -3$
$3a + b = 3$

33. $s + 3t = 27$
$\frac{1}{2}s + 2t = 19$

# Algebra Review: Ratios and Proportions

**Simplify each ratio**

Ex 1/ 4 to 6

$= \frac{4}{6}$

$= \frac{2 \cdot 2}{2 \cdot 3}$

$= \frac{2}{3}$

Ex 2/ 3ab:27ab

$= \frac{3ab}{27ab}$

$= \frac{3ab}{9 \cdot 3ab}$

$= \frac{1}{9}$

Ex 3/ (4a + 4b) : (a + b)

$= \frac{4a+4b}{a+b}$

$= \frac{4(a+b)}{a+b}$

$= \frac{4}{1} = 4$

STEPS
1) Write ratio as a fraction
2) Find and factor out common factors
3) Reduce

**Simplify each ratio**

1) 25 to 15

2) 6 : 9

3) 0.8 to 2.4

4) $\frac{36}{54}$

5) $\frac{7}{14x}$

6) $\frac{12c}{14c}$

7) $22x^2$ to $35x$

8) 0.5ab : 8ab

9) $\frac{1}{4} r^2$ to $6r$

10) $(x^2 + x)$ to $2x$

11) (2x-6) : (6x-4)

12) (9x-9y) to (x-y)

Express each ratio in simplest form

13) shorter leg : longer leg

14) hypotenuse to shorter leg


15) shorter leg: hypotenuse

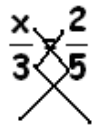
16) hypotenuse: longer leg

17) longer leg to shorter leg

18) longer leg: hypotenuse

**Solve each proportion**

Ex 1: $\frac{x}{3}=\frac{2}{5}$



$5x = 6$

$\frac{5x}{5}=\frac{6}{5}$

$x=\frac{6}{5}$

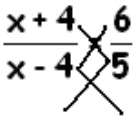
STEPS to solve proportions

1) Cross Multiply

2) Simplify

3) Solve for the variable

Ex 2: $\frac{x+4}{x-4}=\frac{6}{5}$



$5(x+4) = 6(x-4)$

$5x+20=6x-24$

$x = 44$

Solve each proportion

19) $\frac{x}{4}=\frac{3}{5}$

20) $\frac{4}{x}=\frac{2}{5}$

21) $\frac{3x}{7}=\frac{2}{5}$

22) $\frac{8}{x}=\frac{2}{5}$

23) $\frac{x+5}{4}=\frac{1}{2}$

24) $\frac{x+3}{2}=\frac{4}{3}$

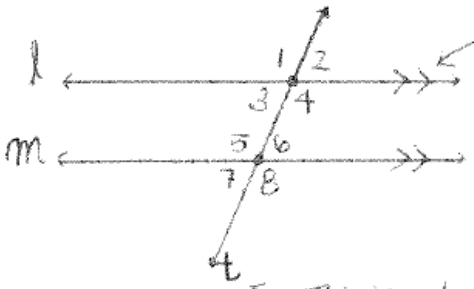
25) $\frac{x+2}{x+3}=\frac{4}{5}$

26) $\frac{2x+1}{4x-1}=\frac{2}{3}$

27) $\frac{x+3}{2}=\frac{2x-1}{3}$

# Angle Relationships

## Parallel Lines and Transversals




This symbol means the lines are **parallel**.

FACTS

$\angle 1 \cong \angle 8 \cong \angle 5 \cong \angle 4$ (all are congruent)

$\angle 2 \cong \angle 3 \cong \angle 6 \cong \angle 7$ (all are congruent)

$m\angle 1 + m\angle 2 = 180°$ because they form a line (180°).
↑ measure of $\angle 1$

This is a transversal (a line intersecting two other lines at two distinct points.)

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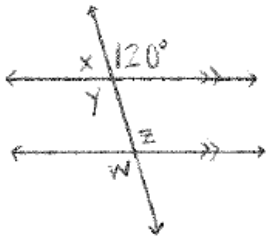
DIRECTIONS: Find all variables for each problem.

① 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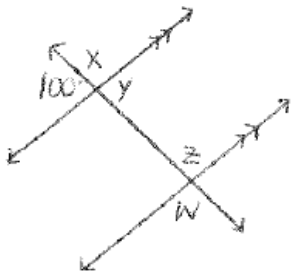
Y =
Z =
W =

② 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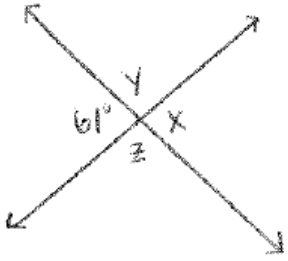
③ 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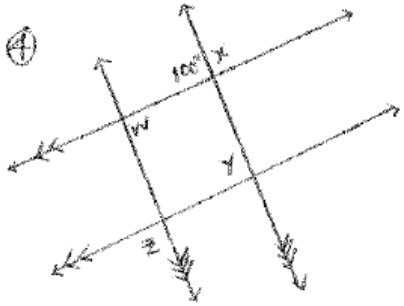
④ 


X =
Y =
Z =
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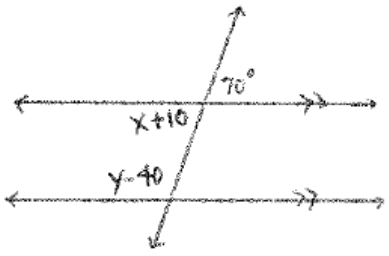
DIRECTIONS: Solve for all variables

⑤ 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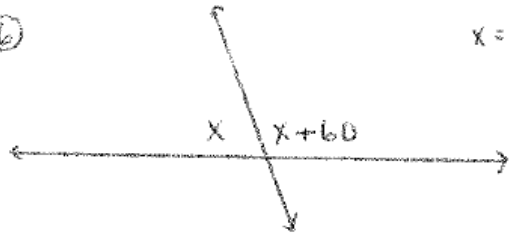
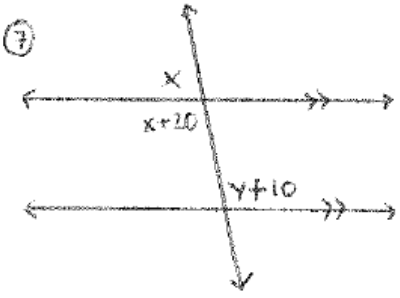
⑥ 


X =

⑦ 


X =
Y =