

Name:
Date:
Hour:

Semester 1 Final Review Guide
Geometry 2016 - 2017
Due on your Final Exam Day

UNIT 1: GEOMETRY BASICS

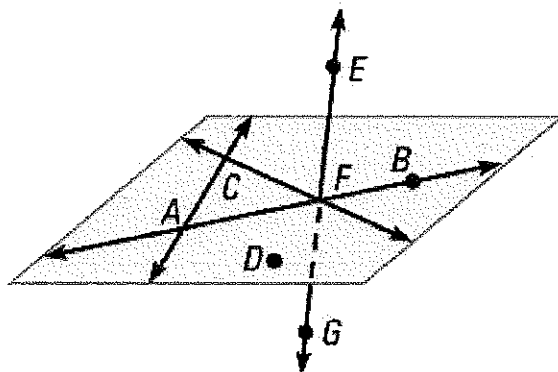
Key vocabulary words and ideas:

- | | | |
|----------------------------------|--|----------------------------|
| ⑧ Midpoint formula (number line) | ⑧ Distance formula (number line) | ⑧ Midpoint formula (x, y) |
| ⑧ Distance formula (x, y) | ⑧ Segment addition postulate | ⑧ Angle addition postulate |
| ⑧ Supplementary | ⑧ Complementary | ⑧ Linear pair |
| ⑧ Vertical angles | ⑧ Segment bisector | ⑧ Angle bisector |
| ⑧ Congruent | ⑧ Ray | ⑧ Right angle |
| ⑧ Adjacent (i.e. adjacent ray) | ⑧ Parallel segments | ⑧ Perpendicular segments |
| ⑧ Skew segments | ⑧ Coplanar | ⑧ Collinear |
| ⑧ Opposite rays | ⑧ Planes (how many letters used to name one) | |

Practice problems

#1-4: Use the image on the right to answer the following:

1. Name 3 points that are collinear. $\overset{EFB}{AFB}$
2. Points A, C, D, and $\overset{BORF}{\quad}$ are coplanar.
3. Point E lines on line $\overset{\leftarrow GE \quad FE \rightarrow}{\quad}$
4. \overrightarrow{FE} and \overrightarrow{FG} are opposite rays.



5. On a real number line, the coordinate point H is -124 and the coordinate point K is -3. What is the coordinate of the midpoint of HK?

$$\frac{-124 + -3}{2} = -63.5$$

6. On a real number line, Point M is at -102 and Point K is at 24. What is the distance between points M and K?

$$|-102 - 24| = 126 \text{ UNITS}$$

7. What is the length between the points (7, 5) and (12, 1)?

$$d = \sqrt{41}$$

$$\sqrt{(12-7)^2 + (1-5)^2} = d$$

$$\sqrt{25+16} = d$$

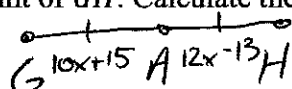
8. What is the midpoint between the points (-2, 8) and (3, -1) on the (x, y) coordinate plane?

$$\frac{-2+3}{2} = .5$$

$$\frac{8+(-1)}{2} = 3.5$$

$$(-.5, 3.5)$$

9. Point A is the midpoint of \overline{GH} . Calculate the value of x is $GA = 10x + 15$ and $AH = 12x - 13$? (Hint: draw a diagram)

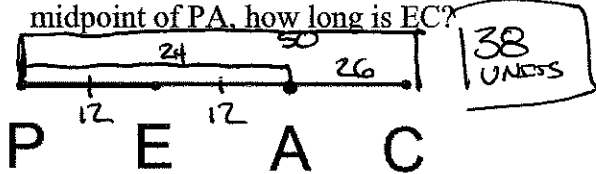


$$10x + 15 = 12x - 13$$

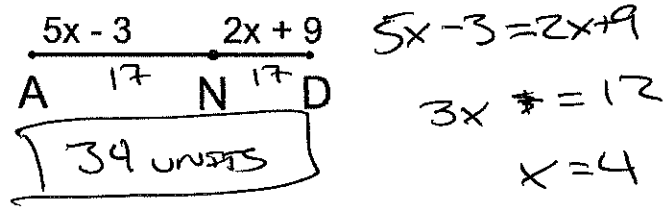
$$28 = 2x$$

$$14 = x$$

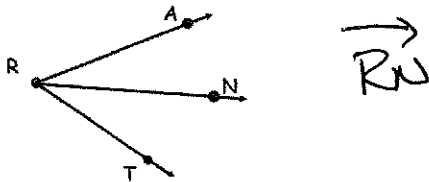
10. If $PA = 24$, $PC = 50$, and E is the midpoint of PA , how long is EC ?



11. In the diagram, N is the midpoint of \overline{AD} . Find the length of \overline{AD} .



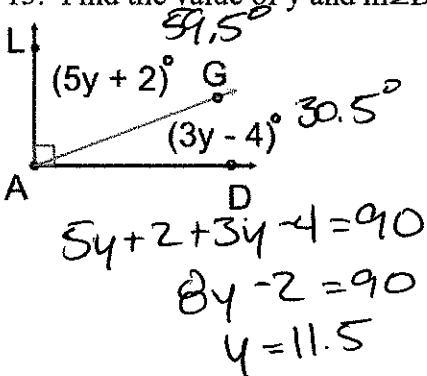
12. In the figure below, which ray is adjacent to $\angle TRN$ and $\angle ARN$?



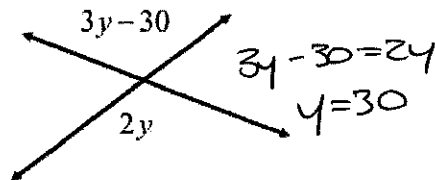
13. Two angles that add up to 90° are COMPLEMENTARY.

14. Two angles that add up to 180° are SUPPLEMENTARY.

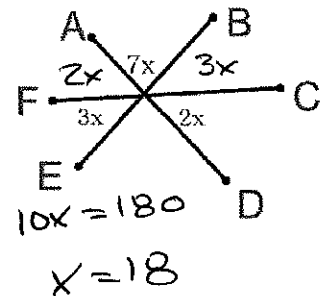
15. Find the value of y and $m\angle DAG$:



16. Find the value of y



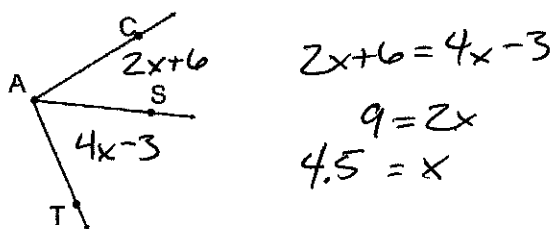
17. What is the value of x ?



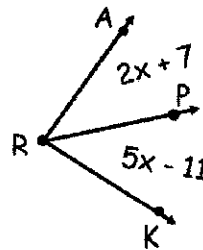
18. In the diagram below, \overline{AS} bisects $\angle CAT$.

$\angle CAS = 2x + 6$ and $\angle SAT = 4x - 3$.

What is the angle measure of $\angle CAT$?

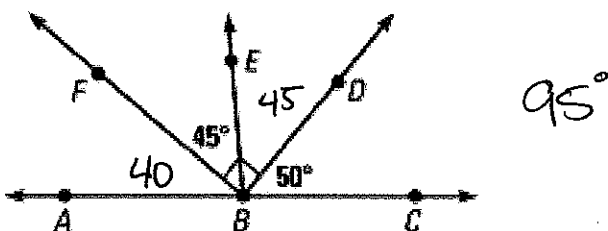


19. Given $m\angle ARK = 80^\circ$, $m\angle ARP = 2x + 7$, $m\angle PRK = 5x - 11$, find the value of x .



$2x + 7 + 5x - 11 = 80$
 $7x - 4 = 80$
 $x = 12$

20. Use the figure to determine the measure of $\angle EBC$.



UNIT 2: PARALLEL LINES & TRANSVERSALS

Key vocabulary words and ideas

⑧ Corresponding angles

⑧ Vertical angles

⑧ Linear pair

⑧ Alternate interior <s

⑧ Alternate exterior <s

⑧ Consecutive interior <s

⑧ Perpendicular Lines

⑧ Skew Lines

⑧ Parallel Lines

⑧ Transversal

*Know which ones are congruent, which are supplementary, and which are complementary

Practice problems

1. Name a pair of...

a. Corresponding angles

1-3, 2-4, 8-6, 7-5

b. Vertical angles

1-7, 2-8, 3-5, 4-6

c. Linear pair

3-6, 6-5, 5-4
1-2, 2-7, 7-8, 8-1, 4-3

d. Alternate interior angles

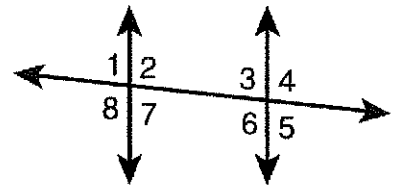
2-6, 3-7

e. Alternate exterior angles

1-5, 8-4

f. Consecutive interior angles

2-3, 7-6



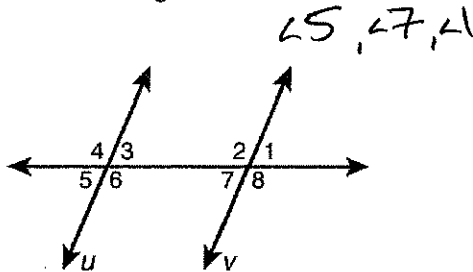
#2-4: Complete the following statements with Congruent, Supplementary, or Complementary.

2. Linear Pairs are Supplementary.

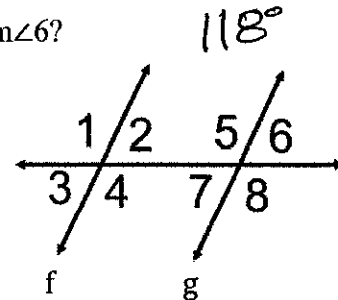
3. When lines are \parallel , Corresponding Angles are Congruent.

4. When lines are \parallel , Alternate Exterior \angle 's are Congruent.

5. In the figure below, if line $u \parallel$ line v ,
what what angles are \cong to $\angle 3$?

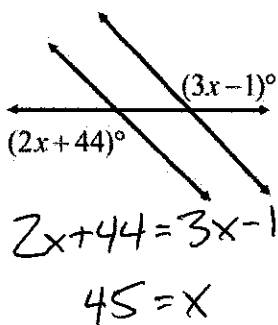


6. In the figure, if line $f \parallel$ line g and $m\angle 4 = 62^\circ$,
is $m\angle 6$?

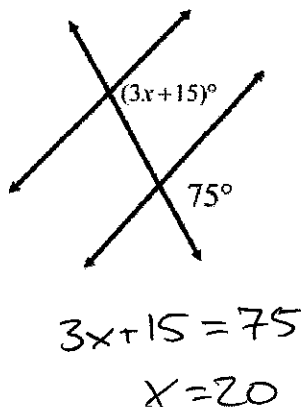


#7-9: Write the equation only (no need to solve) that would be used to solve for x :

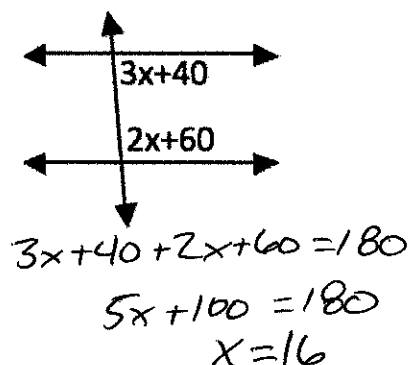
7.



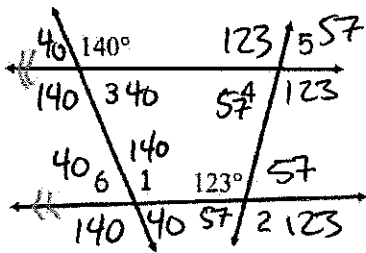
8.



9.

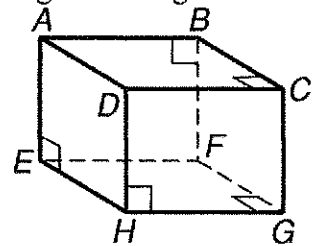


10. Find the measures of angles 1-5:



11. Classify the following sides as parallel, perpendicular, or skew lines using the image to the right.

- \overline{DH} and \overline{CG} PARALLEL
- \overline{BF} and \overline{HG} SKEW
- \overline{AD} and \overline{DC} PERPENDICULAR



UNIT 3: TRIANGLES

Key vocabulary words and ideas:

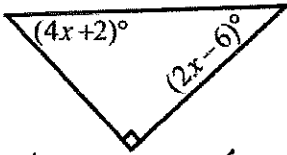
- | | | |
|-------------------------------|------------------------------|------------------------------|
| ⑧ Equilateral triangle | ⑧ Isosceles triangle | ⑧ Scalene triangle |
| ⑧ Acute triangle | ⑧ Obtuse triangle | ⑧ Equiangular triangle |
| ⑧ Right triangle | ⑧ Interior angle sum theorem | ⑧ Exterior angle sum theorem |
| ⑧ Triangle inequality theorem | ⑧ SSS congruence theorem | ⑧ SAS congruence theorem |
| ⑧ ASA congruence theorem | ⑧ Congruence Statement | ⑧ Transitive Property |
| ⑧ Reflexive Property | | |

Practice problems

- Given the congruency statement $\triangle ABC \cong \triangle XYZ$, which angle in $\triangle ABC$ is congruent to $\angle Z$? $\angle C$
- Which property is represented by the following statement? $\overline{AB} \cong \overline{AB}$ REFLEXIVE
- Which property is represented by the following statement? If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$. TRANSITIVE
- Which of the following side lengths can form a triangle? CIRCLE THEM.

A. 7 cm, 2 cm, 9 cm	B. 11 cm, 22 cm, 15 cm	C. 2 cm, 2 cm, 2 cm
D. 9 cm, 4 cm, 12 cm	E. 9 cm, 4 cm, 13 cm	F. 9 cm, 4 cm, 14 cm
- If one side of a triangle had the side lengths of 3 inches and 9 inches:
 - write an inequality to show the possibilities for the 3rd side length of the triangle.
 $6 < x < 12$
 - Write 1 potential length for the triangle's 3rd side.

6. Calculate the value of x.



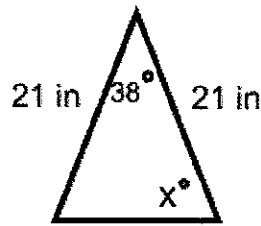
$$90 + 4x + 2 + 2x - 6 = 180$$

$$86 + 6x = 180$$

$$6x = 94$$

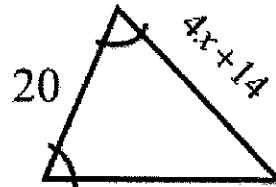
$$x = 15.67$$

7. What is the value of x?



$$\frac{180 - 38}{2} \quad x = 71$$

8. Write the equation used to solve for x.



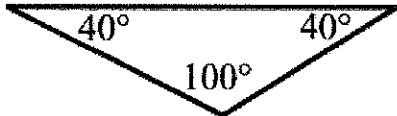
$$6x + 4 + 6x + 4 = 4x + 14$$

$$2x = 10$$

$$x = 5$$

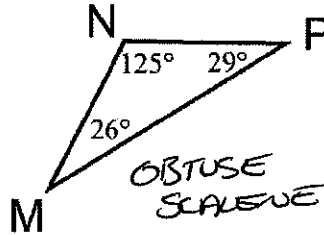
9. Classify the following triangles by their angles and sides.

a.



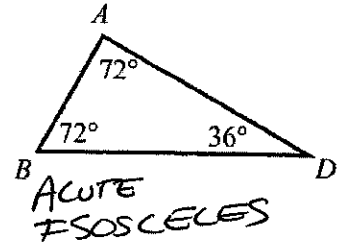
OBTUSE ISOSCELES

b.



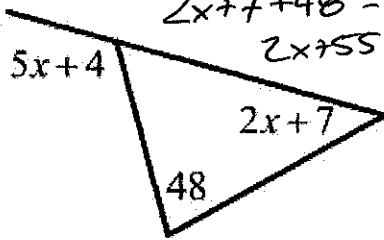
OBTUSE
SCALENE

c.



ACUTE
ISOSCELES

10. Calculate the value of x.



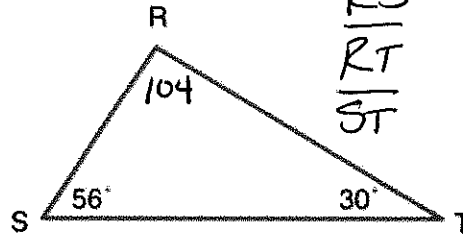
$$2x + 7 + 48 = 5x + 4$$

$$2x + 55 = 5x + 4$$

$$51 = 3x$$

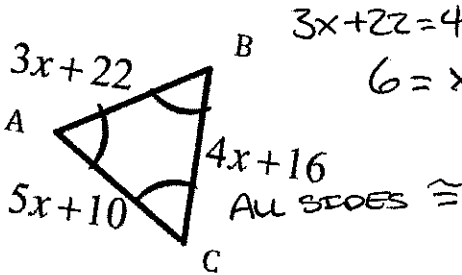
$$x = 17$$

11. Using the angle measures, state the sides in order of smallest to longest.



\overline{RS}
 \overline{RT}
 \overline{ST}

12. What is the length of side AB?

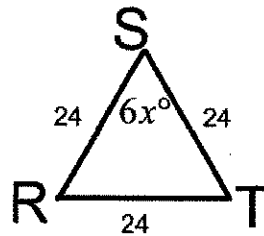


$$3x + 22 = 4x + 16$$

$$6 = x$$

ALL SIDES \cong

13. Write an equation that can be used to successfully calculate x.

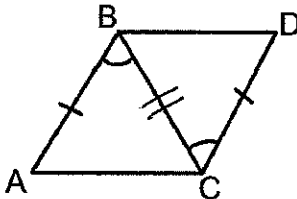


$$6x = 60$$

$$x = 10$$

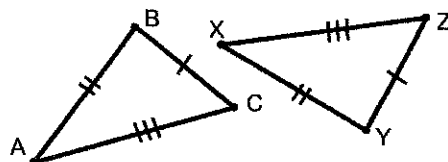
14. Identify the congruence postulates used to prove the two triangles congruent (SSS, SAS, ASA).

a.



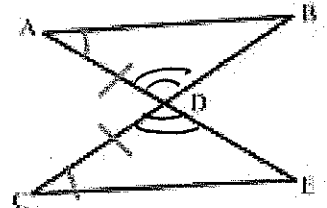
SAS

b.



SSS

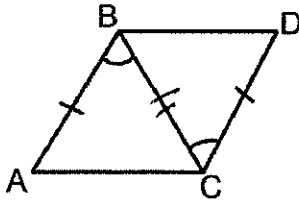
c.



ASA

15. Complete the proof that justifies why the two triangles are congruent using a triangle congruence postulate (SSS, SAS, ASA).

a.



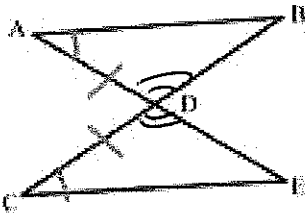
Statements

1. $\underline{AB \cong DC}$
2. $\underline{\angle ABC \cong \angle DCB}$
3. $\underline{BC \cong BC}$
4. Therefore: $\underline{\triangle ABC \cong \triangle DCB}$

Reasons

1. GIVEN
2. GIVEN
3. REFLEXIVE
4. By the SAS Postulate

b.



Statements

1. $\underline{\angle A \cong \angle C}$
2. $\underline{AD \cong CD}$
3. $\underline{\angle ADE \cong \angle CDB}$
4. Therefore: $\underline{\triangle ADB \cong \triangle CDE}$

Reasons

1. GIVEN
2. GIVEN
3. VERTICAL
4. By the ASA Postulate

UNIT 4: COORDINATE GEOMETRY

Key vocabulary words and main ideas

⑧ Midpoint Formula

⑧ Distance Formula

⑧ Transformation

⑧ Translation

⑧ Reflection

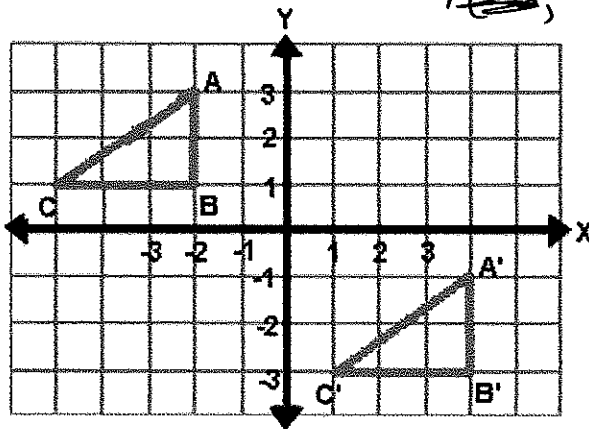
⑧ Rotation

⑧ Composite Transformation

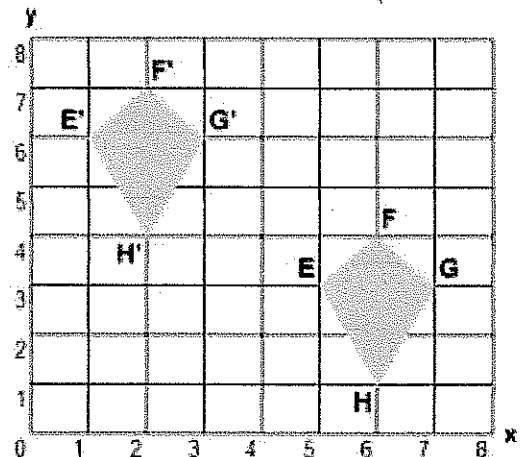
Practice problems

1. Write the rule for the transformations below:

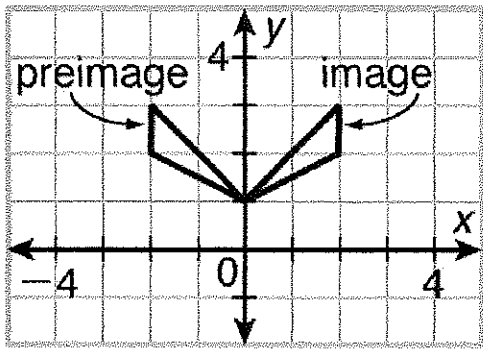
a. $(x, y) \rightarrow \langle +6, -4 \rangle$



b. $(x, y) \rightarrow \langle -4, +3 \rangle$

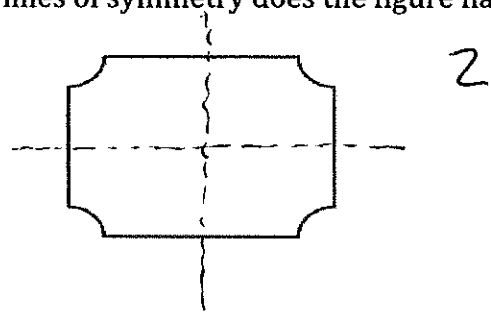


c.

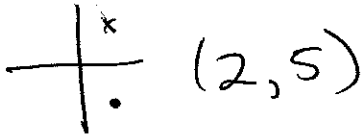


d. How many lines of symmetry does the figure have?

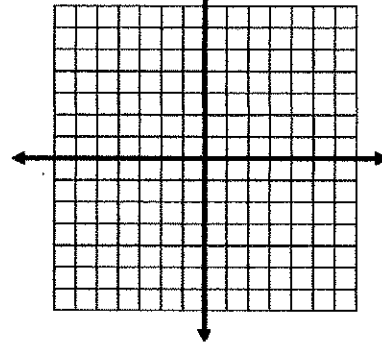
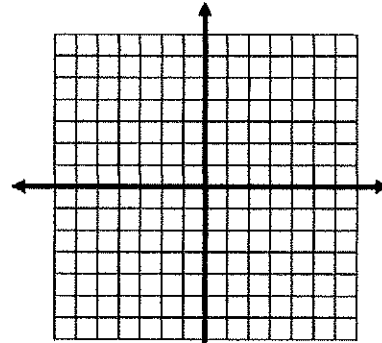
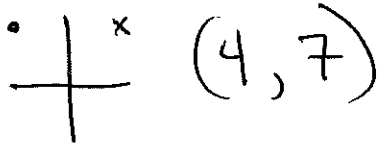
Ry axes



2. What are the new coordinates that represent the image of $(2, -5)$ when reflected over the x-axis?



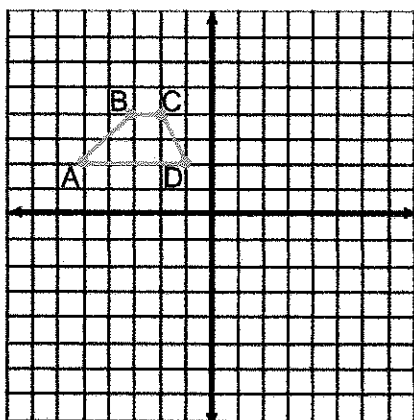
3. What are the new coordinates that represent the image of $(-4, 7)$ when reflected over the y-axis?



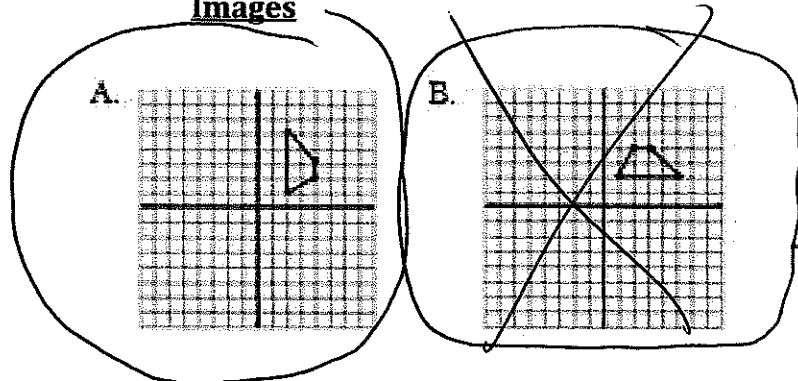
4. Which of the images below shows the preimage quadrilateral rotated 270 degrees counter clockwise?

ANSWER IS "A"

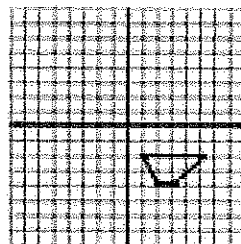
Preimage



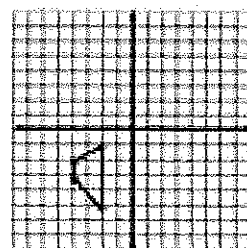
Images



C.

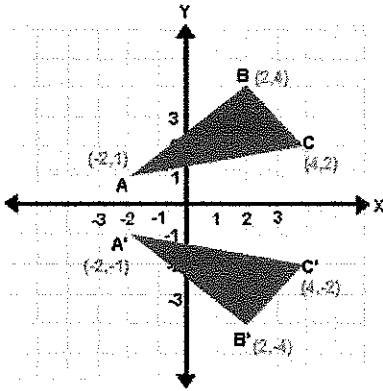


D.

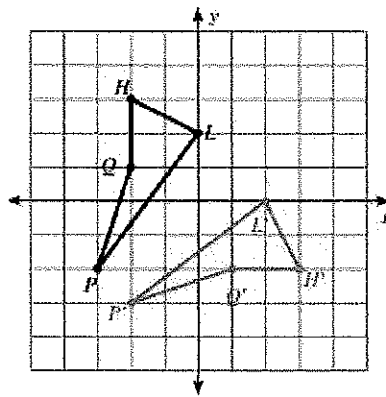


5. Using the figures below, write the equation that represents the line of symmetry between the preimage and image.

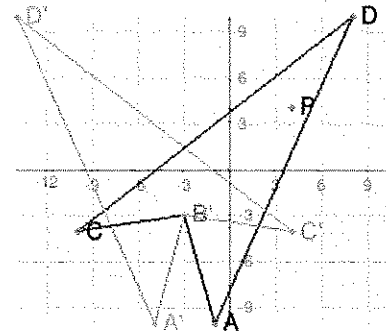
A. X AXIS



B. $Y = X$



C. $X = -3$



6. Complete the following transformations with the image on the right.

Step 1: Reflect quadrilateral ABCD over the line $x = 1$.

Label the new image $A'B'C'D'$.

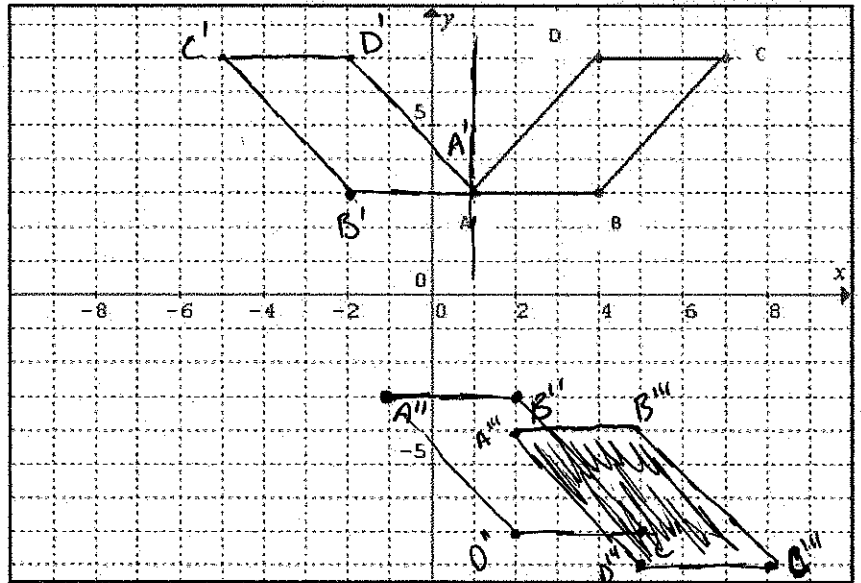
Step 2: Now, take $A'B'C'D'$ and rotate it clockwise 180° around point B' . R_{180°

(You may use the patty paper provided)

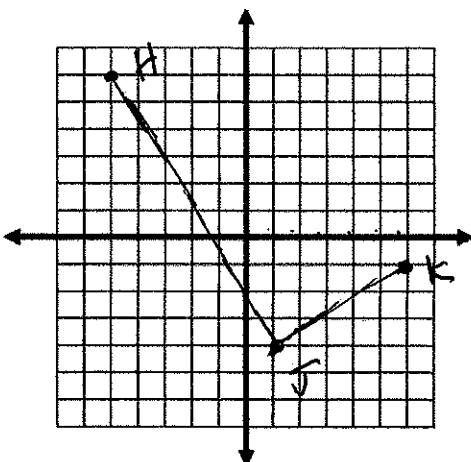
Label the new image as $A''B''C''D''$.

Step 3: Now, take $A''B''C''D''$ and complete the following transformation: $T_{\langle -1, -1 \rangle}$.

Conclusion: Shade in the final quadrilateral.



7. Plot the following vertices in the coordinate plane and then prove that the triangle is a right triangle using slopes. $K(6, -1)$, $J(1, -4)$, and $H(-5, 6)$.



$$\text{SLOPE OF } \overline{HS} = \frac{6 - (-4)}{-5 - 1} = \frac{10}{-6} = -\frac{5}{3}$$

$$\text{SLOPE OF } \overline{JK} = \frac{-1 - (-4)}{6 - 1} = \frac{3}{5}$$

NEGATIVE SLOPES ARE INVERSE ~~PERPENDICULAR~~