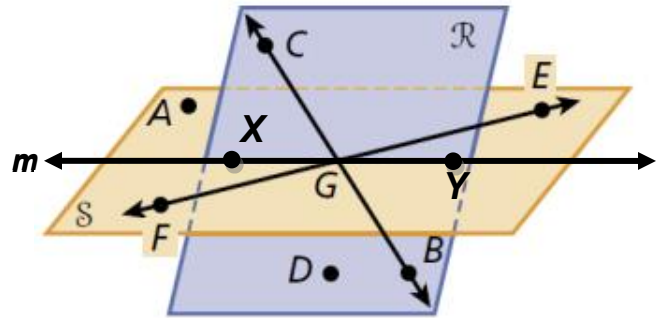**Geometry A**
Final Exam Review

This review will cover all of the same concepts that are covered on the exam. Most of the exam questions are in a multiple-choice format. These are not, but you will need the same skills. The problems are broken down by chapter.

Chapter 1: Basics of Geometry
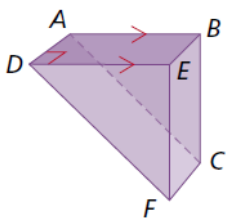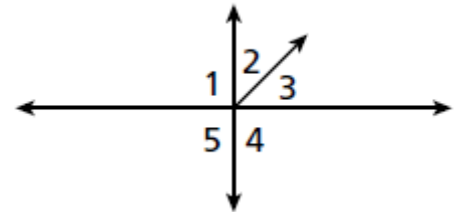
1. Use the diagram at the right to answer the questions:

    Give another name for $\overleftrightarrow{BC}$. _____

    Points F, E, and _____ are collinear

    Points C, D, B and _____ are non-coplanar

    Write the intersection of $\overleftrightarrow{BC}$ and $\overrightarrow{EF}$. _____

    Give another name for plane S. _____

    Write the intersection of $\overrightarrow{XG}$ and $\overrightarrow{GX}$. _____

    Write the intersection of plane R and plane S. _____

2. What are the undefined terms of geometry?

3. Use the diagram to the right to answer the questions

    What angle makes a pair of vertical angles with $\angle 1$? _____
    What angle makes linear pair with $\angle 1$? _____
    What angle makes a pair of vertical angles with $\angle 2$? _____
    What angle is adjacent to $\angle 3$? _____

    4. Use the diagram at the left to answer the following questions

    Name a pair of parallel segments. _____
    Name a pair of perpendicular segments. _____
    Name a pair of skew segments. _____
    Name a pair of parallel planes. _____
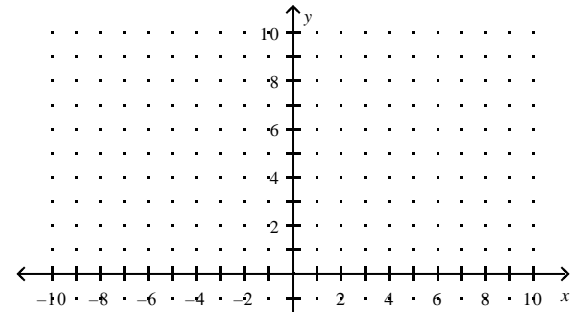
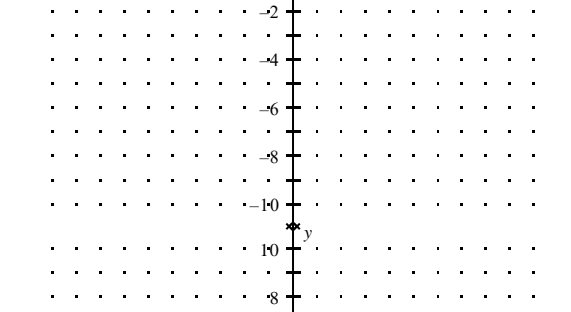5. Given the diagram below, find the following:
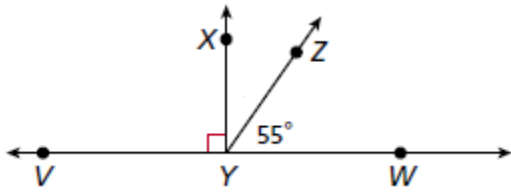
What is $m\angle XYZ$? _____

Classify $\angle XYV$. _____ $\angle WYZ$ _____

6. Complete the following problem. Q is between P and R. $PQ = 3x$, $QR = 6x + 4$, $PR = 14x - 6$.
   Find PQ, QR, and PR.

7. Find the midpoint of $\overline{AB}$ with endpoints $A(-4, 6)$ and $B(3, 2)$.
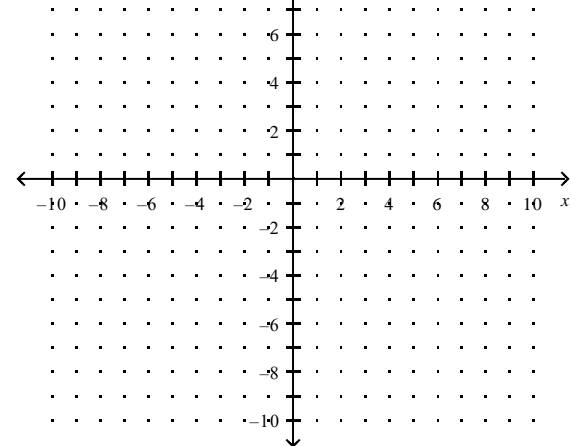   Show work to support your answer.

8. Find the distance between L and M if $L(-4, 2)$ and $M(3, -2)$.
   Show work to support your answer.

9. Determine if the segments are parallel, perpendicular or neither. Show work *with slopes* to support your answer.

   $\overline{ST}$ and $\overline{UV}$ with $S(-4,5)$, $T(2,3)$, $U(-1, 4)$, $V(-2, 1)$

*You will also be asked to CONSTRUCT a perpendicular bisector and an angle bisector.

Chapter 2: Reasoning and Proofs

10. Write the converse, inverse, and contrapositive of the following conditional. Then, determine their truth value:

"If we have a snow day, then school is closed."

Hypothesis: _____

Conclusion: _____

Converse: _____

Inverse: _____

Contrapositive: _____

11. Determine if each statement is true or false. If the statement is false, give a counterexample:

If the month is February, then there are 28 days in the month. _____

If $x = 6$, then $x^2 = 36$. _____

If 2+2=4, then it rains cats and dogs. _____

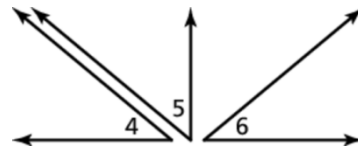12. Complete the conclusion based on the **Law of Syllogism**.
    Given: If you mow the neighbor's yard, then you earn $20.
              If you earn $20, then you will go to the movies.

    Conclusion: If you mow the neighbor's yard, then _____

13. Complete the proof of the **Congruent Complements Theorem.**
    Given: $\angle 4$ and $\angle 5$ are complementary
                  $\angle 6$ and $\angle 6$ are complementary

    Prove: $\angle 4 \cong \angle 6$

Statement	Reason
1.	Given
2.	Definition of complementary angles
3.	Given
4.	
5.	Transitive Property of Equality
6. $m\angle 5 = m\angle 5$	
7. $m\angle 4 + m\angle 5 - m\angle 5 = m\angle 5 - m\angle 5 + m\angle 6$	
8.	Simplify
9.	

14. Write justifications for the following statements:

If $RS = ST$ and $ST = TU$, then $RS = TU$.

$\angle 3 \cong \angle 3$

If $\overline{GH} \cong \overline{JK}$, then $\overline{JK} \cong \overline{GH}$

If $a = b$, then $a + 5 = b + 5$

If $\angle ABC$ is a right angle, then $m\angle ABC = 90°$

If Y is the midpoint of $\overline{XZ}$, then $\overline{XY} \cong \overline{YZ}$.

If $\angle C \cong \angle D$, then $m\angle C = m\angle D$.

If G is between F and H, then $FG + GH = FH$

If $\angle A$ and $\angle B$ are supplementary, then $m\angle A + m\angle B = 180°$

If $\overline{JK} \cong \overline{LM}$, then $JK = LM$

If $3(x + 4)$, then $3x + 12$.

If $\overrightarrow{BD}$ bisects $\angle ABC$, then $\angle ABD \cong \angle DBC$

15. Geoff is really excited to learn about triangles next week. Over the weekend, he is exploring different triangles and their angle measures. After exploring many triangles, he notices a pattern. All of the measures of the angles inside the triangle seem to add to 180 degrees. Using _____ _____ reasoning, he makes a _____ that the angles in a triangle always sum to 180 degrees. Using _____ reasoning and Mrs. Gerrish's help, he proves the conjecture to be true.

16. Write the definition as a biconditional:
"Congruent angles have the same angle measure."

Chapter 3: Parallel and Perpendicular Lines

17. Given the diagram below, find of the pairs of…
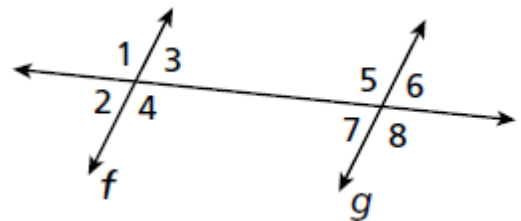
corresponding angles

vertical angles

linear pairs

alternate interior angles

alternate exterior angles

same-side interior angles

18. Determine if the following relationships prove that the lines are parallel. If so, you should have a theorem/postulate that supports it. If not, determine if there is "not enough info" or "not parallel"
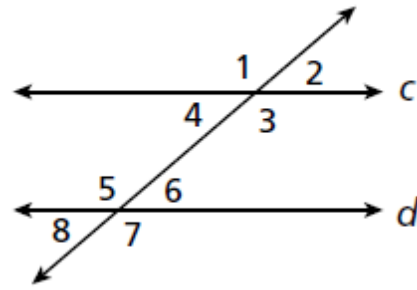
$m\angle 3 = 150°$, $m\angle 6 = 30°$

$m\angle 4 = 90°$, $m\angle 5 = 90°$

$\angle 4 \cong \angle 8$

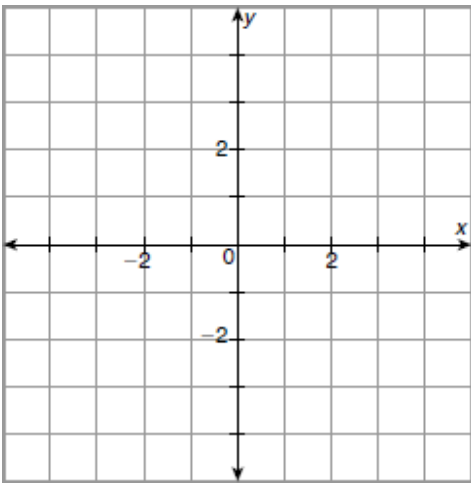$\angle 1 \cong \angle 3$

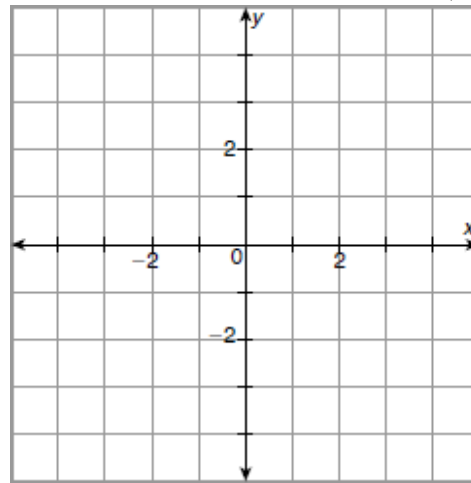$m\angle 4 = 50°$, $m\angle 6 = 50°$

$m\angle 2 = 80°$, $m\angle 8 = 80°$

Chapter 4: Transformations

19. $\triangle KLM$ has vertices $K(4,-2)$, $L(3,3)$, and $M(-2,-1)$. GRAPH AND LABEL the preimage and image under each of the following transformations: (21)

a. rotation of 90° about the origin

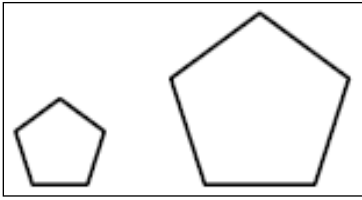b. translation along the vector $\langle -2,1 \rangle$

c. reflection across the x-axis
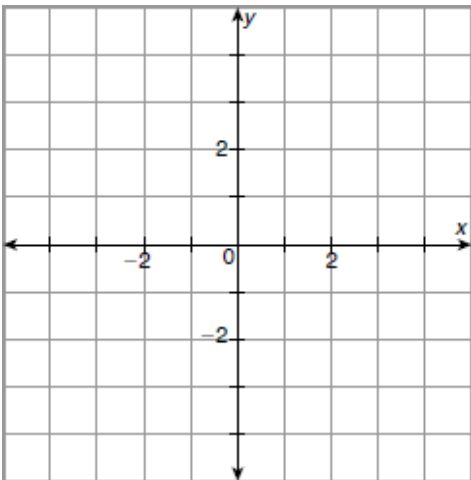
d. dilation of scale factor $k = 1.5$
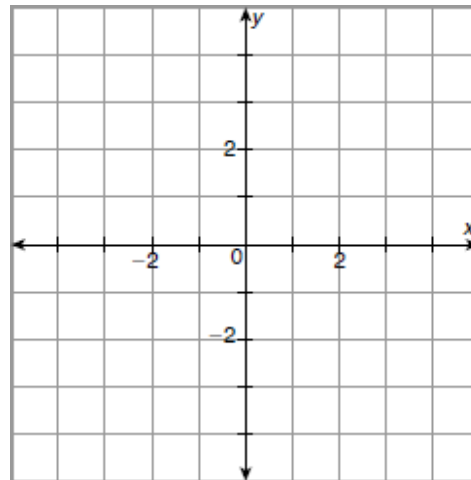
20. State which transformation is being shown. Your choices are: **reflection**, **translation**, **rotation**, **dilation**, or **none**.
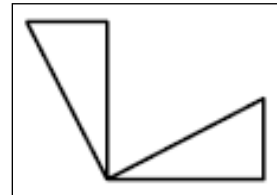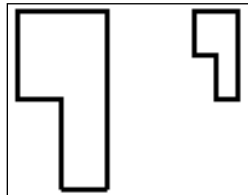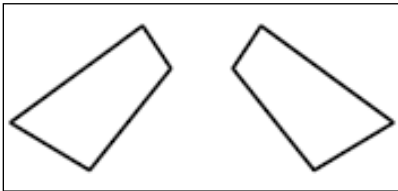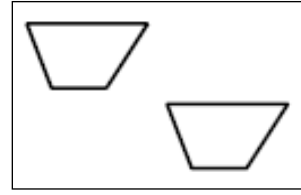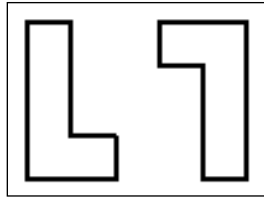
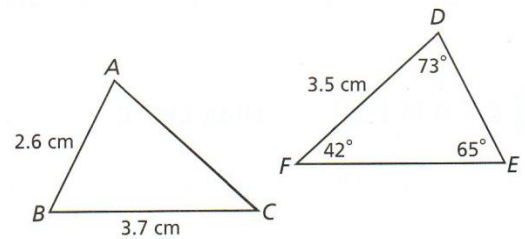21. You will also be expected to construct any or all of the four transformations by hand.

Chapter 5: Congruent Triangles

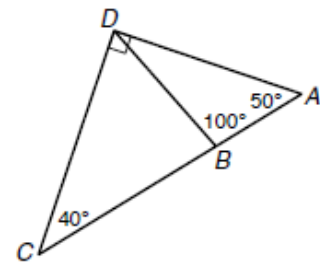22. Given that $\triangle ABC \cong \triangle DEF$, find each of the following:
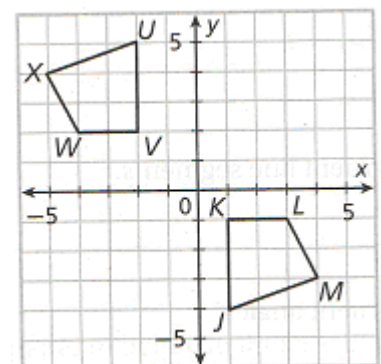
    m∠A _____

    DE _____

    m∠B _____

23. State the reason you were able to find each number in the previous problem, both the abbreviation (hint – it's a 5 letter abbreviation) and what the abbreviation stands for.
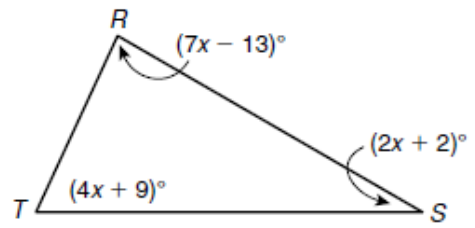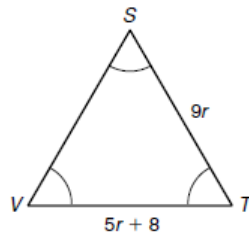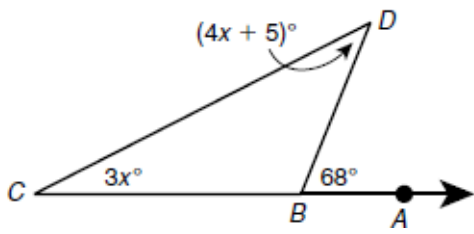
24. Find each of the missing angles of the triangle below.

25. Identify a sequence of rigid motions that will map figure *JKLM* onto figure *UVWX*.

26. Find the value of the variable in each of the following figures.

$(4x + 5)°$ D

$3x°$ $68°$
C   B   A

S

$9r$

V   T
$5r + 8$

R $(7x - 13)°$

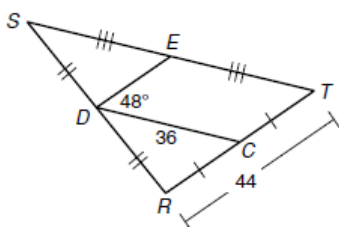$(2x + 2)°$

$(4x + 9)°$
T   S

27. State which item from the list at the right can be used to determine whether the triangles are congruent. It's possible for items on the list to be used more than once, or not at all.
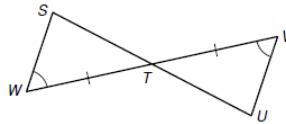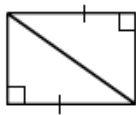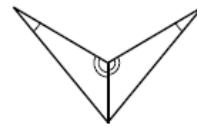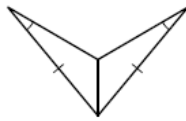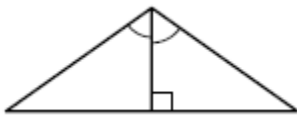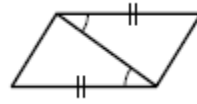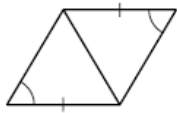
a. SSS
b. SAS
c. ASA
d. AAS
e. HL
f. none

Chapter 6: Relationships within Triangles

S
   E
   48°
D
   36
      C
      44
   R

28.   Use the triangle at the left to do the following:
      State the length of *DE*.

      Name another angle that measures 48°

29.   Use the triangle at the right to do the following

HL, *JK*, and *IM* are all medians, so point *N* is the _____ of the triangle

Find the following lengths: *NL* = _____   *IM* = _____

I
K
   N
H   6 m   L

2.5 m M

J