Review Test 2 - Chapters 3 and 4
Test 2 will be on Wed. April 29; Prepare this Review for Monday, April 27

Review of the definitions, theorems, and properties learned. Answer the following questions. Make a drawing for each situation. Then translate the statements mathematically.

TRIANGLES

1. When are two **triangles congruent?**

2. What special case of congruency do you know in the case of **two right triangles**?

3. **A triangle is isosceles** if and only if _____.

4. **A triangle is isosceles** if and only if _____.

5. **A triangle is equilateral** if and only if _____.

6. **A triangle is equilateral** if and only if _____.

7. **The measure of an exterior angle** of a triangle is equal to _____.

8. **The sum of the measures of the angles** of a triangle is _____.

9. If two sides of a triangle are congruent, then the angles opposite them are _____

10. Given a line and a point not on the line, the _____ is **the shortest segment that can be drawn from the point to the line**.

11. **The segment that joins the midpoints of two sides** of a triangle is _____ to the third side and its length is _____.

12. **An angle bisector of a triangle** is _____.

13. **A median of a triangle** is _____.

14. **An altitude of a triangle** is _____.

15. **A perpendicular bisector of a side** of a triangle is _____.

PARALLEL LINES / PARALLEL LINES CUT BY TRANSVERSALS

1. If three or more parallel lines cut congruent segments on one transversal, then they cut _____ on every transversal.

2. Two lines are parallel if they lie in the same _____ and do not _____.

3. Given two lines with one transversal, then two lines are parallel if and only if

    a) One pair of _____ are congruent.

or

    b) One pair of _____ are congruent.

or

    c) One pair of _____ are congruent.

or

    d) One pair of same-side interior angles are _____.

or

    e) One pair of same-side exterior angles are _____.

4. If two coplanar lines are perpendicular to a third line, then they are _____ to each other.

QUADRILATERALS

In a parallelogram,

    1- the opposite sides are _____ and _____.

and

    2- the opposite angles are _____.

and

    3- the diagonals are not _____; they are not _____;

      they _____ each other.

and

    4- the sum of the measures of the angles is _____.

5. A quadrilateral is a parallelogram if :

      a) two opposite sides are _____ and _____

or

      b) both pairs of opposite angles are _____.

or

      c) diagonals _____ each other.

In a rectangle,

      6- the opposite sides are _____ and _____.

and

      7- all angles are _____, each _____.

and

      8- the diagonals are _____ ; they are not _____;

      they _____ each other.

and

      9- the sum of the measures of the angles is _____.

In a square,

      10- the opposite sides are _____ and all sides are _____.

and

      11- all angles are _____, each _____.

and

      12- the diagonals are _____ ; they are _____;

      they _____ each other.

and

      13- the sum of the measures of the angles is _____.

In a rhombus,

      14- the opposite sides are _____ and _____.

and

      15- the opposite angles are _____.

and

      16- the diagonals are not _____; they are _____;

      they _____ each other.

and

      17- the sum of the measures of the angles is _____.

In a trapezoid,

     18- one pair of opposite sides are _____ , but not _____.

and

     19- the diagonals are not _____; they are not _____;

     they do not _____ each other.

and

     20- the sum of the measures of the angles is _____.

     21- the median is the segment joining the _____.

     and it is _____ to the bases and its length is equal to _____

In an isosceles trapezoid,

     22- the unparallel sides also known as _____ are _____

and

     23- the base angles are _____.

and

     24- the diagonals are _____; they _____ bisect each other.

25. A trapezoid is isosceles if:

     a) _____ are congruent

or

     b) _____are congruent.

Answers: **TRIANGLES**
1. SAS, SSS, ASA, AAS   2. HL   3. it has two congruent sides   4. it has two congruent angles
5. it has all three sides congruent   6. it has all three angles congruent (each of measure 60 degrees)
7. the sum of the measures of the two nonadjacent interior angles of the triangle   8. 180 degrees
9. congruent   10. perpendicular segment from the point to the line   11. parallel; half of the third side
12. the bisector of an angle of the triangle   13. the segment that joins one vertex with the midpoint of the opposite side   14. the line segment from one vertex perpendicular to the opposite side (or its extension)   15. the line that is perpendicular to the side at the midpoint
Answers: **PARALLEL LINES CUT BY TRANSVERSALS**
1. congruent segments   2. plane; intersect   3a. corresponding angles   3b. alternate interior angles
3c. alternate exterior angles   3d. supplementary   3e. supplementary   4. parallel

Answers: **QUADRILATERALS**

1. parallel; congruent   2. congruent   3. congruent; perpendicular; bisect   4. 360 degrees

5a. parallel; congruent   5b. congruent   5c. bisect each other   6. parallel; congruent

7. congruent; 90 degrees   8. congruent; perpendicular; bisect   9. 360 degrees   10. parallel; congruent   11. congruent; 90 degrees   12. congruent; perpendicular; bisect   13. 360 degrees

14. parallel; congruent   15. congruent   16. congruent; perpendicular; bisect   17. 360

18. parallel; congruent   19. congruent; perpendicular; bisect   20. 360 degrees

21. midpoints of the unparallel sides; parallel; half of the sum of the bases   22. legs; congruent   23. congruent   24. congruent; do not   25a. diagonals   25b. two base angles

Review the following :

Handout Sections 3.1   Problems   4, 6   (see handout and solutions on the website)

Handout Chapter 3 – Applications   (see handout and solutions on the website)

Handout Section 4.1   (see handout and solutions on the website)

Handout Section 4.4   (see handout and solutions on the website)

Quiz #2

Homework problems from Chapter 3 and Chapter 4

Know the formal proofs of the following theore ms:

Handout Section 3.1   Theorem: T 3.1

Section 3.3   T 3.11

Handout Section 4.1   Theorems: C4.2, T 4.4, T4.5, T4.7, T4.8

Section 4.2   Theorem 4.10

Handout Section 4.4   Theorems: T4.21

Answer true or false:

2) An isosceles triangle can have an obtuse angle as one of its angles.   _____

4) If three angles of one triangle are congruent with three angles of a second triangle, then the two triangles are congruent.   _____

5) Triangles can be proved congruent using SSA.   _____

6) Corresponding parts of congruent triangles are congruent.   _____

7) The median to the base of an isosceles triangle bisects the vertex angle.   _____

9) An exterior angle of a triangle is the supplement of one of the interior angles of the triangle._____

10) If two angles of one triangle are congruent to two angles of a second triangle, the third angles are not necessarily congruent.   _____

11) If a transversal is perpendicular to one of two parallel lines, it is perpendicular to the other line also.

      _____

12) If two angles of a quadrilateral are right angles, the quadrilateral is a rectangle.   _____

13) A parallelogram is also a trapezoid. _____

14) In a trapezoid, two sides are always parallel. _____

15) If the four sides of a quadrilateral are congruent, it must be a square. _____

16) In a parallelogram, the diagonals bisect the angles. _____

17) In a rhombus, the diagonals bisect the angles. _____

19) Two similar triangles are also congruent. _____

21) If an acute angle of a right triangle is congruent to an acute angle of a second right triangle, then the two triangles are similar. _____

(Answers: 2T, 4F, 5F, 6T, 7T, 9T, 10F, 11T, 12F, 13F, 14T, 15F, 16F, 17T, 19F, 21T)

More practice

1. Which lines are parallel if

        a) $\angle 1 \cong \angle 3$?
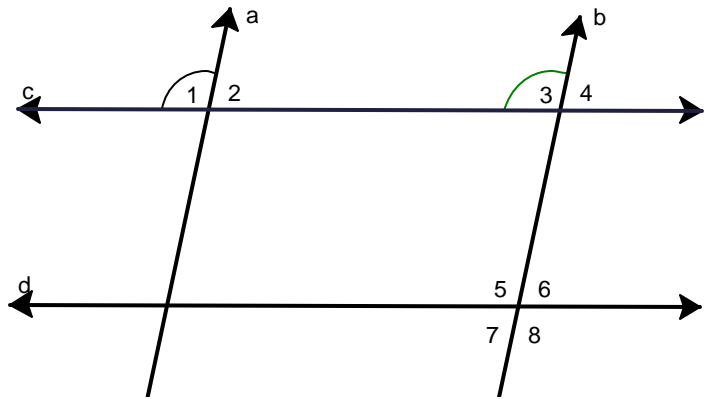
        b) $\angle 3 \cong \angle 8$

2.   Given: $\overline{XY} \parallel \overline{WZ}$
              $\angle 1 \cong \angle 2$

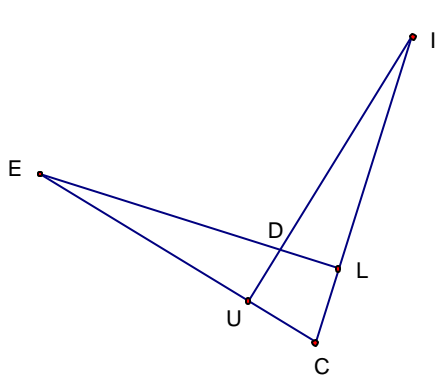   Prove: $\overline{MN} \parallel \overline{XY}$
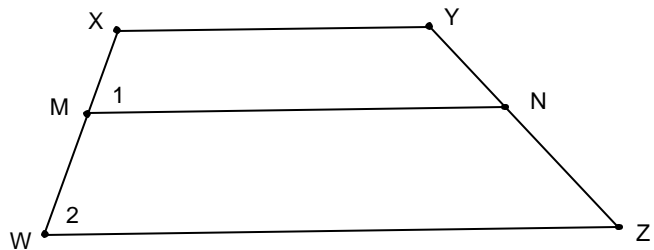
3.
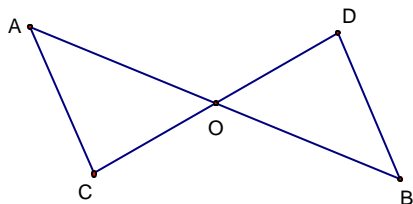
       Given $\overline{AB}$ bisects $\overline{CD}$
               $\overline{CD}$ bisects $\overline{AB}$

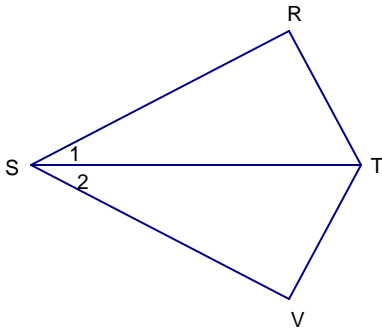   Prove $\triangle AOC \cong \triangle BOD$

4.

Given $\overline{IU} \perp \overline{EC}$

$\overline{EL} \perp \overline{IC}$

$\overline{CL} \cong \overline{CU}$
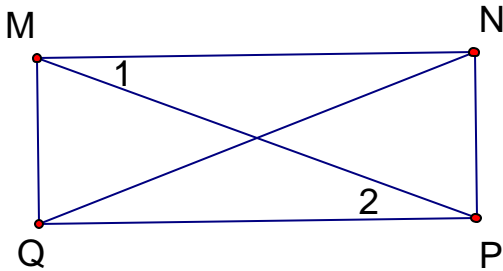
Prove $\triangle ECL \cong \triangle ICU$

5.

If $\angle R$ and $\angle V$ are right angles and $\angle 1 \cong \angle 2$, prove that $\triangle RST \cong \triangle VST$.

6. In a right triangle *FDG* with right angle *D*, the bisector of angle *D* intersects the opposite side at *E*. The acute angles of the triangle are congruent. Prove that *E* is the midpoint of the side FG.
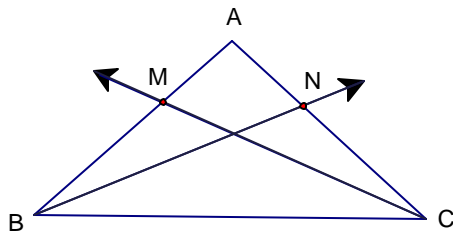
7

Given $\angle 1 \cong \angle 2$

$\overline{MN} \cong \overline{QP}$

Prove $\overline{MQ} \parallel \overline{NP}$

8.

Given $\angle ABC \cong \angle ACB$

$\overrightarrow{BN}$ bis $\angle ABC$

$\overrightarrow{CM}$ bis $\angle ACB$

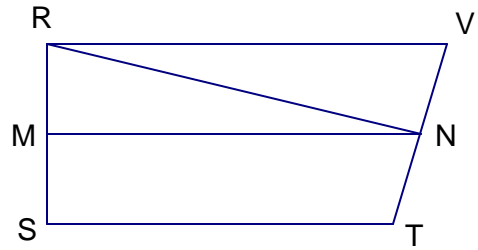Prove $\triangle BMC \cong \triangle CNB$

9. Given: RSTV trapezoid

$\overline{RV} \parallel \overline{ST}$

$m\angle SRV = 90°$

M, N midpoints

ST = 13 in, RV = 17 in, RS = 16 in

Find: RN.

10. Given: $\overline{AB} \cong \overline{CD}$

$\angle ABD \cong \angle CDB$

Prove: ABCD parallelogram