Review Test 1
Chapters 1 & 2 and Appendix L

To prepare for the test, learn all definitions, be familiar with all theorems and postulates, study all exercises and theorems done in class as well as the following problems. Know how to translate a statement, problem or theorem into hypothesis (what is given), conclusion (what needs to be proved) and an appropriate drawing to illustrate the given situation.

Logic (Appendix L & 1.4)

Handout Introduction	Exercises # 9, 10, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 Symbolic forms and proofs of DeMorgan's Laws, Law of Detachment, Law of Negative Inference, Law of Syllogism.
Handout Section 1.4	Exercises #3, #4
Homework #1	

Chapter 1

Important terms and concepts:

- point, line, plane
- properties of equality
- collinear points
- coplanar points
- line segment
- length of a line segment
- ray
- opposite rays
- angle
- types of angles
- pairs of angles (vertical, complementary, supplementary, adjacent)
- midpoint of a segment
- bisector of a segment
- perpendicular lines
- distance from a point to a line
- angle bisector

Homework #1,2	
Handout Sections 1.2 & 1.3	Exercises # 4, 5 (write all steps down), 7, 8, 11, 12

Important Postulates

(see handout sections 1.2, 1.3)

1) Two points determine a line.
2) Three noncollinear points determine a plane.
3) Given two points in a plane, the line containing these points also lies in the plane.
4) Segment – Addition Postulate
5) Angle – Addition Postulate

(see section 1.6)

6) Each line segment has exactly one midpoint.
7) Each angle has exactly one bisector.
8) Each line segment has exactly one perpendicular bisector.
9) There is exactly one line perpendicular to a given line passing through a given point on the line.
10) There is exactly one line perpendicular to a given line passing through a given point not on the line.

Important theorems

Know the formal proofs of the theorems marked with an asterisk *.

*1) The Addition / Subtraction Theorem for segments: The sum or difference of congruent segments yields congruent segments (Section 1.5 – T 1 ,T2)

*2) The Addition/Subtraction Theorem for angles: The sum or difference of congruent angles yields congruent angles (1.5 – T3, 4)

* 3) Two equal supplementary angles are right angles (1.5 – T1.5)

* 4) Complements of equal angles are equal (1.5 – T1.6)

* 5) Supplements of equal angles are equal (1.5 – T 1.8)

6) Vertical angles are equal in measure (1.5 – 1.11)

7) All right angles are equal in measure (1.6 – T1.12)

* 8) Adjacent angles with 2 sides in a line are supplementary (1.5 – T 1.10)

Chapter 2

Important terms and concepts:

- Triangle
- types of triangles
- perimeter of a triangle
- interior angle of a triangle
- exterior angle of a triangle
- congruent triangles
- isosceles triangles
- equilateral triangles
- median
- altitude
- perpendicular bisector
- bisector of an angle

Homework #2

Handout Section 2.4 Exercises # 3, 4, 5, 6

Handout Chapter 2 – Applications All problems

Know when two triangles are congruent: SAS, ASA, SSS, AAS (section 2.2 and in class) and the special cases for right triangles LA and LL (section 2.5).

Know the following constructions (including proof):

1) Construct the bisector of a given angle (2.3 – T4 ; see construction in 1.6) – in class
2) Construct the midpoint of a given segment (2.3 – T2 ; see construction in 1.6) – in class

Know the formal proof of the following theorem:

1) Two sides of a triangle are congruent if and only if the opposite angles are congruent. (2.4 – T2.5, T2.7) – in class

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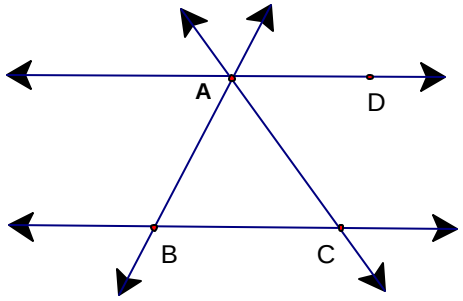
Do you know the definitions and theorems we have studied in Chapters 1 and 2?
Have you understood the definitions and theorems or did you just memorize them?

1)



Use the figure to name the geometric figures requested:

a) four lines
b) four line segments
c) eight rays
d) two segments whose intersection is empty.

2) Answer true or false:

a) EJ represents the length of $\overline{EJ}$.

b) If $EJ = JS$, then $\overline{EJ} \cong \overline{JS}$.

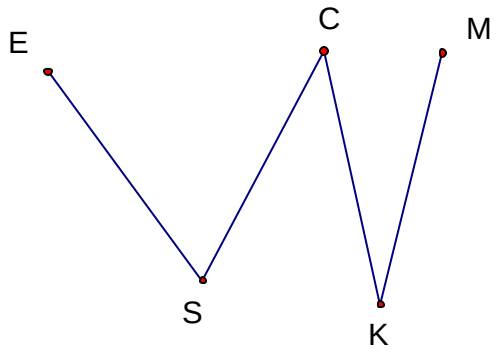
c) If $\overline{AB} \cong \overline{CD}$, then $AB = CD$.

d) If $EJ > JS$, then $\overline{EJ} \cong \overline{JS}$.

e) If $\overline{TJ} \cong \overline{KR}$, then TJ could be less than KR.

f) Given any $\overline{AB}$ and any $\overrightarrow{LM}$, there exists a unique point P on $\overrightarrow{LM}$ such that $\overline{LP} \cong \overline{AB}$.

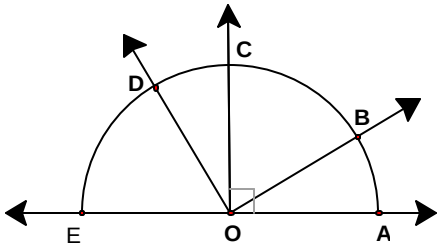
3)



Given $\overline{ES} \cong \overline{CK}$
$\overline{CK} \cong \overline{KM}$
$\overline{KM} \cong \overline{CS}$

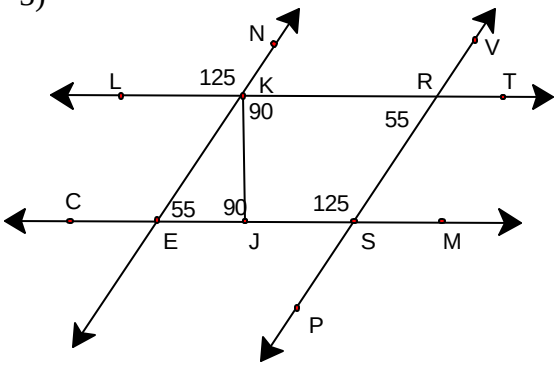
Prove $\overline{ES} \cong \overline{CS}$

4)



Given the figure, name:
a) three acute angles
b) Two right angles
c) One obtuse angle
d) One straight angle
e) Two complementary angles
f) Two supplementary angles
g) Two adjacent angles
h) Two nonadjacent angles
i) Two opposite rays
j) Three noncollinear points.

5)

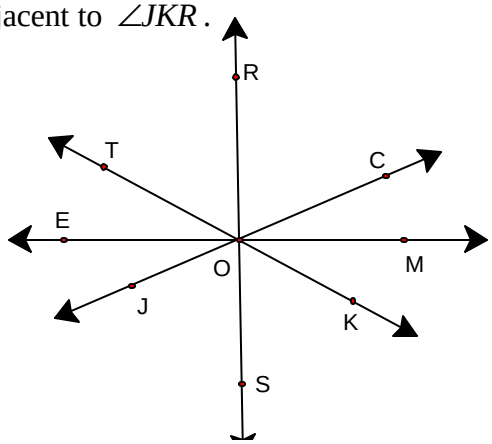


Given the figure as marked, answer True or False:
a) $\angle EJK$ is a right angle.
b) $\angle LKN$ and $\angle PSM$ are vertical angles.
c) $\angle LKN$ is supplementary to $\angle NKR$.
d) $\angle JSR$ is complementary to $\angle RSM$.
e) $\angle LKE \cong \angle KRS$
f) $\angle EKJ$ is complementary to $\angle KEJ$
g) $\angle EKJ$ is adjacent to $\angle JKR$.

6) Use the figure to answer true or false.

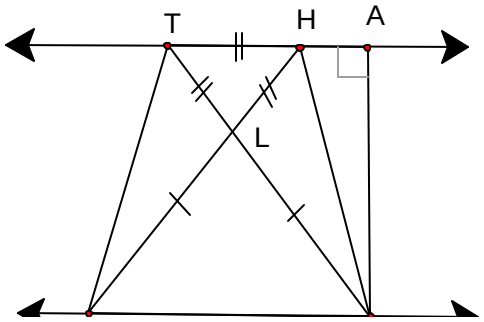
Given $\overleftrightarrow{RS} \perp \overleftrightarrow{EM}$

$m\angle TOE = m\angle JOE = 30^\circ$



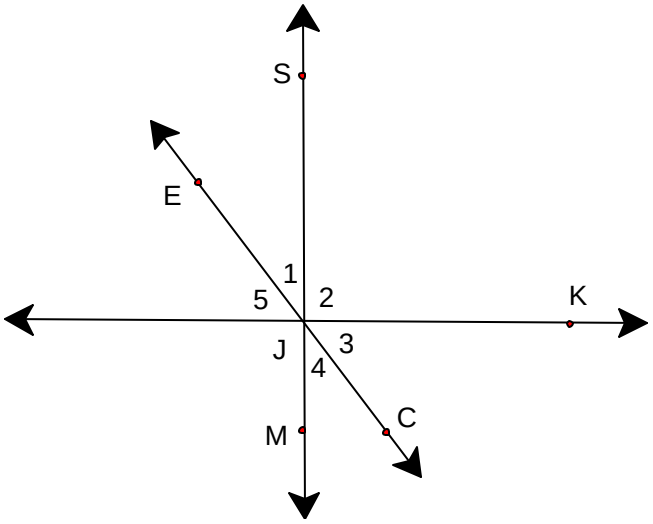
a) $\angle MOS$ is a right angle
b) $\angle JOE \cong \angle MOC$
c) $m\angle EOR = m\angle EOT + m\angle TOR$
d) $\angle ROC$ and $\angle KOS$ are vertical angles.

7)



Use the figure to answer
a) Name four acute triangles
b) Name four obtuse triangles.
c) Name one right triangle.
d) Name one isosceles triangles.
e) Name one equilateral triangle.

8)



Given $\overleftrightarrow{JK} \perp \overleftrightarrow{SM}$
$m\angle EJK = 118^\circ$

Find angles 1 through 5
(Informal proof; justify your steps)

9) Answer the following questions or complete the statements:

a) When are two triangles congruent?

b) A triangle is isosceles if and only if _____

c) A triangle is equilateral if and only if _____

d) An angle bisector of a triangle is _____

e) A median of a triangle is _____

f) An altitude of a triangle is _____

g) A perpendicular bisector of a side of a triangle is _____

10) Draw a figure and write the hypothesis and conclusion. Mark the figure and write a formal proof.

a) If two line segments are medians of an equilateral triangle, then they are congruent.

b) If the bisector of an angle of a triangle is perpendicular to the opposite side, then the triangle is isosceles.

c) If a line segment is the median from the vertex angle of an isosceles triangle, then it bisects the vertex angle.

d) If the median of a triangle is perpendicular to one of its sides, then the triangle is isosceles.

e) In a triangle if an angle bisector is an altitude, then it is also a median.

11) Answer true or false:

1) The hypotenuse is the side opposite one of the acute angles in a right triangle. _____

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

3) A right isosceles triangle has two right 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. _____

8) An exterior angle of a triangle is the supplement of one of the interior angles of the triangle.____

9) Any isosceles triangle is equilateral. _____

10) Any equilateral triangle si isosceles. _____

11) Any acute triangle is equilateral. _____

12) Any equilateral triangle is an acute triangle. _____

Answers: 1F, 2T, 3F, 4F, 5F, 6T, 7T, 8T, 9F, 10T, 11F, 12T

12) Given an equilateral triangle ABC and $\overline{AM}$ and $\overline{BN}$ medians, show that $\overline{AM} \cong \overline{BN}$.

13) Two statements are given. If possible, write a third statement that can be deduced from these statements. Otherwise, write " no deduction possible".

a) If I have reached the party to whom I am speaking, then I have dialed correctly.
I have indeed reached the party to whom I am speaking.
Therefore, …….

b) All night owls hoot it up.
Fred never gives a hoot.
Therefore, ….

c) Tom would be a gardener if he had a green thumb.
If Tom were a gardener, he would raise bonsai trees.
Therefore,…

14) Determine if the argument is valid or invalid using a truth table.

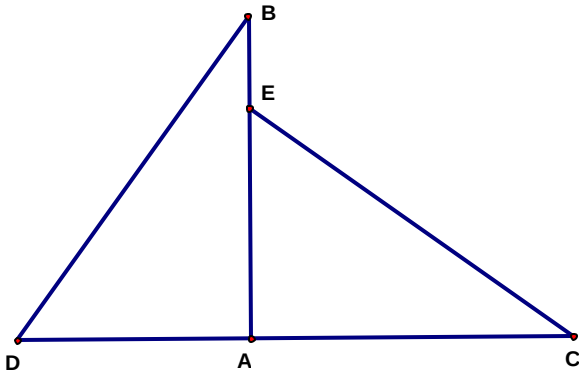
If my checked arrives in time, I'll register for the fall semester.
I've registered for the fall semester.

_____

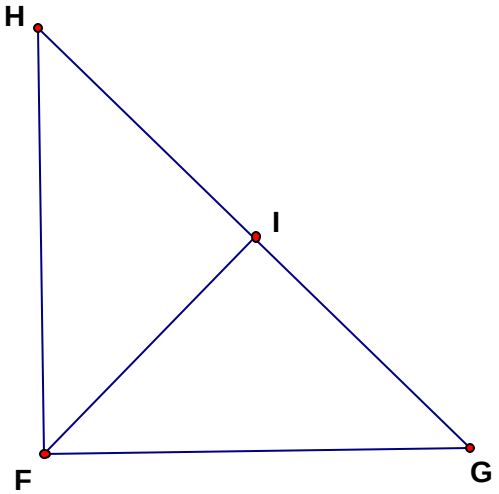
My check arrives in time.

15) Given: $\overline{BA} \perp \overline{DC}$
$\overline{BA} \cong \overline{CA}$
$\angle B \cong \angle C$

Prove: $\angle BDA \cong \angle CEA$



16)



Given: $\overline{FH} \cong \overline{FG}$
I midpoint of segment HG

Prove: $\overline{FI}$ bisects $\angle HFG$

17)

Given: $\overline{DB} \perp \overline{BC}$
$\overline{CE} \perp \overline{DE}$
$\overline{AB} \cong \overline{AE}$

Prove: $\triangle BDC \cong \triangle ECD$