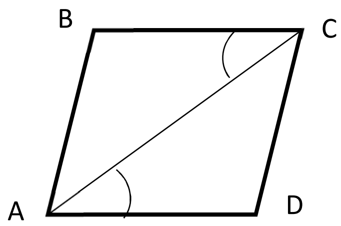
Math 213 Exam 2A Fall 2016 Name____

1(7). Consider the figure below.

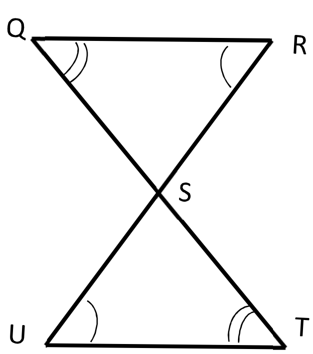
a. What additional information would you need to show that $\Delta CBA \cong \Delta ADC$ by ASA?



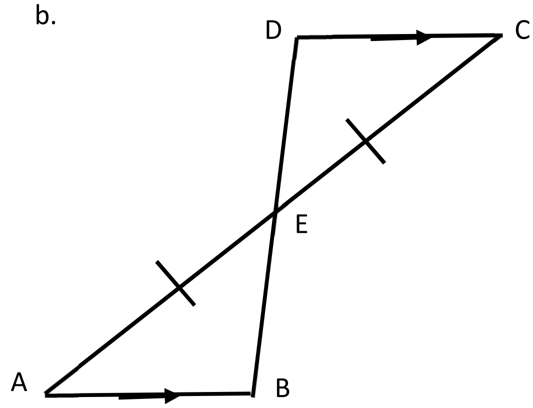
b. Is $\overline{BC} \mid\mid \overline{AD}$? Justify your answer.

2(16). For each of the four figures below, determine whether or not the pair of triangles illustrated are congruent. If they are, state the congruence and the property (e.g. $\Delta XYZ \cong \Delta UVW$ by SAS). Write "not enough information" if it is not possible to determine whether or not the triangles are congruent.

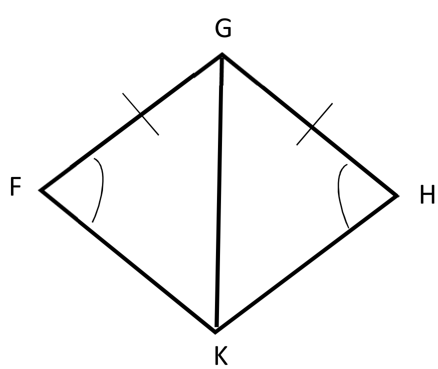
a.



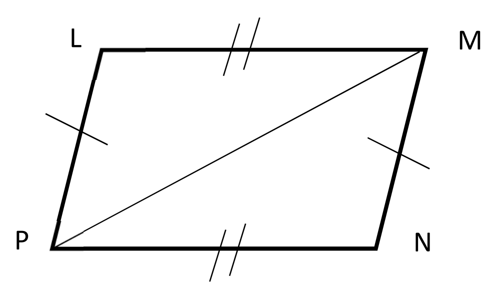
b.



c.



d.



3(12). a. Translate the following statement into an equivalent “If—then—“ statement:

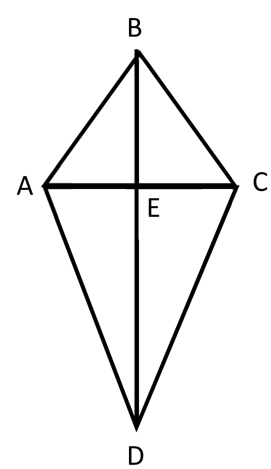
Opposite sides of a parallelogram are congruent.

b. Write the converse of the statement in part a.

c. Write the contrapositive of the statement in part a.

d. Which of the statements you wrote in parts b and c are equivalent to your statement in part a?

4(18). Fill in the missing statements and reasons in the following two-column proof.



Given: $\overline{AB} \cong \overline{BC}$; $\overline{AD} \cong \overline{CD}$

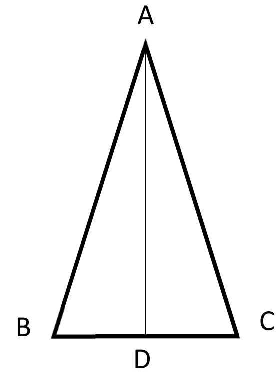
Prove: $\overline{AC} \perp \overline{BD}$

Statement	Reason
1.	1. Given
2.	2. Reflexive property
3. $\Delta ABD \cong \Delta CBD$	3.
4. $< ABD \cong < CBD$	4.
5. $\overline{BE} \cong \overline{BE}$	5.
6. $\Delta ABE \cong \Delta CBE$	6.
7. $< AEB \cong < CEB$	7.
8. <AEB is supplementary to <CEB	8.
9. <AEB and <CEB are right angles	9. A pair of angles which are both supplementary and congruent are right.
10.	10. Definition of perpendicular lines

5(4). Find the flaw in the following "proof."

Given: $\overline{AB} \cong \overline{AC}$

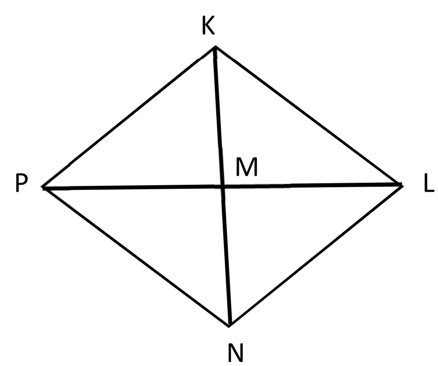
Prove: $< ABC \cong < ACB$



Statement	Reason
1. $\overline{AB} \cong \overline{AC}$	1. Given
2. Draw $\overline{AD}$, the perpendicular bisector of $\overline{BC}$	2. There is a unique perpendicular bisector from a point to a line
3. $<ADB = <ADC = 90°$	3. Definition of perpendicular lines
4. $\overline{BD} \cong \overline{CD}$	4. Definition of bisect
5. $\overline{AD} \cong \overline{DA}$	5. Reflexive property
6. $< ADB \cong < ADC$	6. All right angles are congruent
7. $\Delta ADB \cong \Delta ADC$	7. SAS
8. $< ABC \cong < ACB$	8. CPCTC

6(12). Consider figure KLNP at right.

Answer each of the following statements as True or False.



a. If KLNP is a rhombus, then $\overline{KN} \cong \overline{LP}$

b. If KLNP is a rhombus, then $\Delta KMP \cong$ ΔKML

c. If KLNP is a rhombus, then $\Delta KPN \cong \Delta LNP$

d. If KLNP is a rectangle, then $\overline{KN} \cong \overline{LP}$

e. If KLNP is a rectangle, then $\Delta KMP \cong \Delta KML$

f. If KLNP is a rectangle, then $\Delta KPN \cong \Delta LNP$

7(12). In each case below, draw a Venn diagram that illustrates the appropriate relationship among the sets listed.

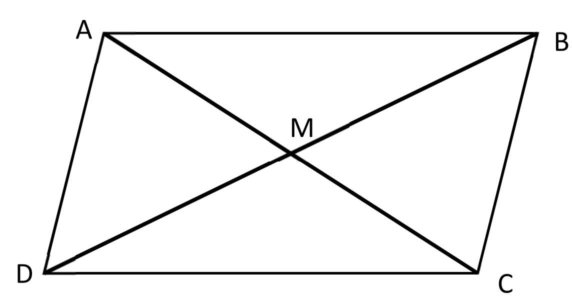
a. right triangles, isosceles triangles, and equilateral triangles

b. rhombuses, kites, and parallelograms

c. parallelograms, rectangles, quadrilaterals with congruent diagonals

8(9). Complete the following proof by filling in the blanks to make a logical argument.

Prove: The diagonals of a parallelogram bisect each other.



Since the opposite sides of a parallelogram are congruent, $\overline{AB} \cong \overline{CD}$.

By definition, the opposite sides of a parallelogram are _______________, so $\overline{AB} \parallel \overline{CD}$.

We know $< BAM \cong < DCM$ and $< ABM \cong < CDM$ because

____

So $\Delta ABM \cong \Delta CDM$ by ________.

Therefore $\overline{AM} \cong \overline{MC}$ and $\overline{BM} \cong \overline{DM}$ because _____________________.