1de 2,3,5,6

Math 213 Exam 2A Spring 2017 Name____

1(15). Consider the following statement: **The diagonals of a parallelogram bisect each other.**

a. Write the bold statement above as an equivalent "If—then—" statement.

If a shape is a p'gram then its diagonals bisect each other.

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

If a ~~shape~~ quadrilateral has diagonals that bisect then it is a p'gram

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

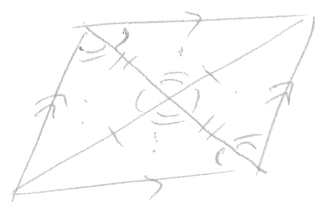
If a quadrilateral does not have diagonals that bisect then it is not a p'gram

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

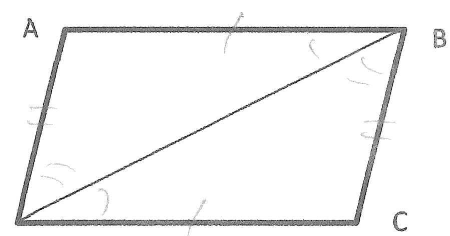
c.

e. Which of the statements you wrote in parts b and c is TRUE?

Both



2(10). Consider the quadrilateral ABCD shown at right with diagonal $\overline{BD}$.



Which of the following given conditions would guarantee that ABCD is a parallelogram? Write "yes" if the conditions would be sufficient; write "no" if they are not sufficient.

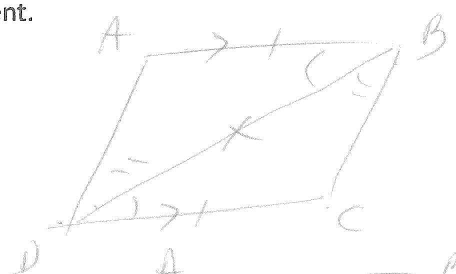
__Yes__ $\overline{AB} \cong \overline{CD}$; $\overline{AD} \cong \overline{BC}$

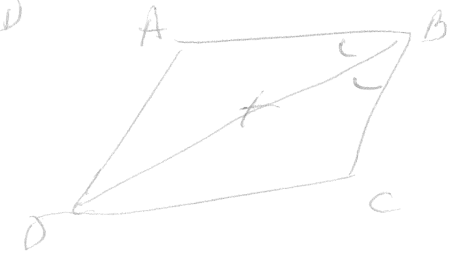
__Yes__ $\overline{AB} \cong \overline{CD}$; $\overline{AB} \parallel \overline{CD}$

__No__ $\overline{AB} \cong \overline{CD}$; $\overline{AD} \parallel \overline{BC}$

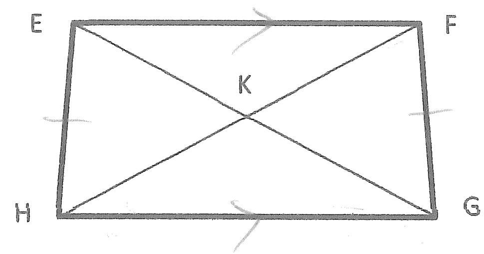
__Yes__ $\Delta ABD \cong \Delta CDB$

__No__ $\overline{BD}$ bisects $< ABC$





3(14). Given: EFGH is an isosceles trapezoid with $\overline{EF} \parallel \overline{GH}$,



Which of the following conclusions can be proved?

Write "yes" if the given statement can be proved; write "no" if it cannot be proved.

No $\overline{EF} \cong \overline{GH}$

Yes $\overline{EG} \cong \overline{FH}$

Yes $\overline{EH} \cong \overline{FG}$

Yes $\Delta EGH \cong \Delta FHG$

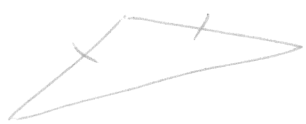
No $\Delta EKF \cong \Delta GKH$

No $\overline{EG}$ and $\overline{FH}$ bisect each other

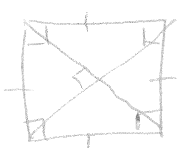
No $\Delta EHG \cong \Delta HEF$

4(15). For each of the following sets of conditions, if possible sketch an example of a shape that fits the given criteria. Mark any congruent parts, perpendicular and parallel segments as relevant. If it is not possible, explain briefly. If the shape you draw has a more specific name, include it.

a. an obtuse isosceles triangle

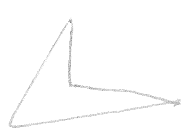


b. a rectangle with perpendicular diagonals



square

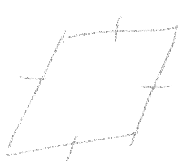
c. a quadrilateral that is not convex



d. an equilateral right triangle

not possible – Equilateral Δ's have three 60° ∠'s

e. a kite that is also a parallelogram



rhombus

4(10). Answer each of the following as Always true (A), Sometimes true (S), or Never true (N).

__A__ a. A rhombus is a parallelogram.

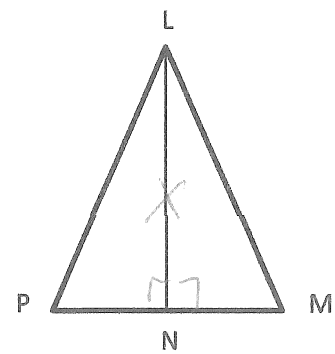
__A__ b. A triangle is convex.

__S__ c. A parallelogram has congruent diagonals.

__A__ d. A square has diagonals that bisect each other.

__S__ e. A kite has four congruent sides.

5(6). Critique the following proof.



Given: $\overline{LN} \perp \overline{PM}$

Prove: ΔLMP is isosceles

Statement	Reason
1. $\overline{LN} \perp \overline{PM}$	1. Given
2. $< LNP = < LNM = 90°$	2. Definition of perpendicular
3. $\overline{LN} \cong \overline{LN}$	3. Reflexive property
4. $\overline{PN} \cong \overline{MN}$	4. Definition of midpoint
5. $\Delta LNP \cong \Delta LNM$	5. SAS
6. $\overline{LP} \cong \overline{LM}$	6. Definition of congruent triangles (CPCTC)
7. ΔLMP is isosceles	7. Definition of isosceles

Identify the step where an error occurs. What is wrong?

Step 4. Cannot assume $\overline{LN}$ is also a median

Is there an alternate correct way to complete this proof? Explain briefly.

~~Define LN as the a~~

Not without additional given information

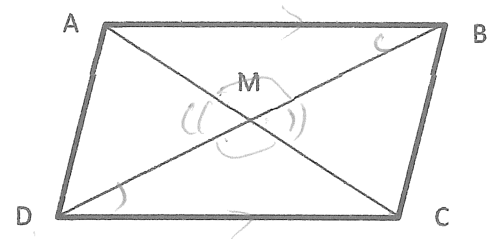
Need additional $\cong$ <'s ($\angle P \cong \angle M$) or need to have $\overline{LN}$ given as $\perp$ bisector

6(20). Fill in the missing steps in the following proof.

Theorem: A quadrilateral with diagonals that bisect each other is a parallelogram.

Given: $\overline{AM} \cong \overline{MC}$; $\overline{BM} \cong \overline{MD}$

Prove: ABCD is a parallelogram



Statement	Reason
1. $\overline{AM} \cong \overline{MC}$; $\overline{BM} \cong \overline{MD}$	1. Given
2. $< DMC \cong < BMA$	2. Vertical <'s ≅
3. $\triangle AMB \cong \triangle CMD$	3. SAS
4. $< ABM \cong < CDM$	4. CPCTC
5. $\overline{AB} \parallel \overline{DC}$	5. If alt int <'s ≅ then lines ∥
6. $< BMC \cong < DMA$	6. Vertical <'s ≅
7. $\triangle AMD \cong \triangle CMB$	7. SAS
8. $< ADM \cong < CBM$	8. CPCTC
9. $\overline{AD} \parallel \overline{BC}$	9. If alt int <'s ≅ then lines ∥
10. ABCD is a parallelogram	10. Def'n p'gram

Please copy and sign: I pledge on my honor that I have not given or received any unauthorized assistance on this exam. [signed]