Name Schlansky
Mr. Schlansky

Date ____________
Geometry

Quadrilateral Properties Review Sheet

1. Which quadrilateral has diagonals that always bisect its angles and also bisect each other? rhombus

1) rhombus
2) rectangle
3) parallelogram
4) isosceles trapezoid

2. Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals? rhombus

1) the rhombus, only
2) the rectangle and the square
3) the rhombus and the square
4) the rectangle, the rhombus, and the square

3. A parallelogram must be a rhombus when its

1) Diagonals are congruent.
2) Opposite sides are parallel.
3) Diagonals are perpendicular.
4) Opposite angles are congruent.

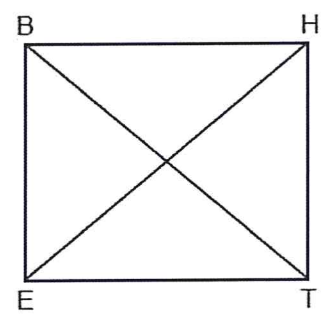
4. A parallelogram must be a rectangle when its

1) diagonals are perpendicular
2) diagonals are congruent
3) opposite sides are parallel
4) opposite sides are congruent

5. Parallelogram *BETH*, with diagonals $\overline{BT}$ and $\overline{HE}$, is drawn below. What additional information is sufficient to prove that *BETH* is a rectangle?

congruent diagonals

1) $\overline{BT} \perp \overline{HE}$
2) $\overline{BE} \parallel \overline{HT}$
3) $\overline{BT} \cong \overline{HE}$
4) $\overline{BE} \cong \overline{ET}$

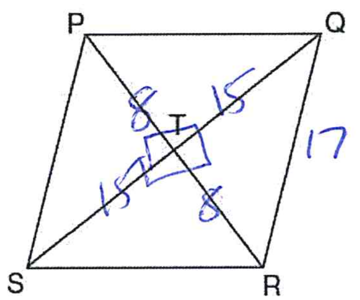


6. Parallelogram *EATK* has diagonals $\overline{ET}$ and $\overline{AK}$. Which information is always sufficient to prove *EATK* is a rhombus?

1) $\overline{EA} \perp \overline{AT}$
2) $\overline{EA} \cong \overline{AT}$
3) $\overline{ET} \cong \overline{AK}$
4) $\overline{ET} \cong \overline{AT}$

consecutive sides ≅

7. In the diagram of rhombus *PQRS* below, the diagonals $\overline{PR}$ and $\overline{QS}$ intersect at point *T*, $PR = 16$, and $QS = 30$. Determine and state the perimeter of *PQRS*.



$a^2+b^2=c^2$

$8^2+15^2=c^2$

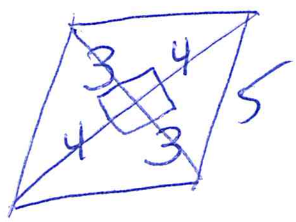
$64+225=c^2$

$\sqrt{289}=\sqrt{c^2}$

$17=c$

$4(17)=\boxed{68}$

8. A rhombus has diagonals that measure 6 and 8. Find the perimeter of the rhombus.



$a^2+b^2=c^2$

$3^2+4^2=c^2$

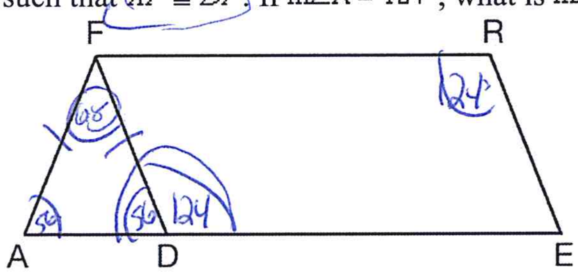
$9+16=c^2$

$\sqrt{25}=\sqrt{c^2}$

$5=c$

$4(5)=20$

9. In the diagram of parallelogram *FRED* shown below, $\overline{ED}$ is extended to *A*, and $\overline{AF}$ is drawn such that $\overline{AF} \cong \overline{DF}$. If $m\angle R = 124°$, what is $m\angle AFD$?



$180 - 124 = 56$

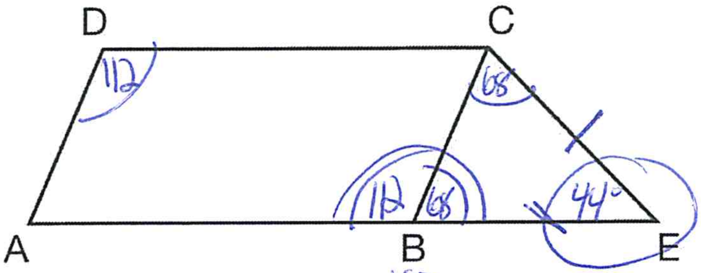
$\triangle AFD$

$56 + 56 = 112$

$180 - 112 = 68$

10. In the diagram below, $ABCD$ is a parallelogram, $\overline{AB}$ is extended through B to E, and $\overline{CE}$ is drawn. If $\overline{CE} \cong \overline{BE}$ and $m\angle D = 112°$, what is $m\angle E$?

$\triangle$

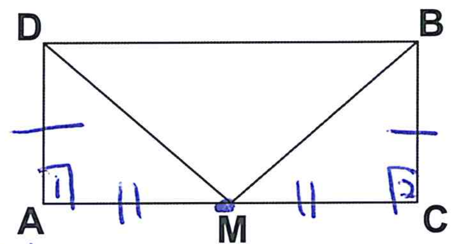


$\triangle BCE$

$$\begin{array}{r} 68 \\ +68 \\ \hline 136 \end{array} \qquad \begin{array}{r} 180 \\ -136 \\ \hline 44 \end{array}$$

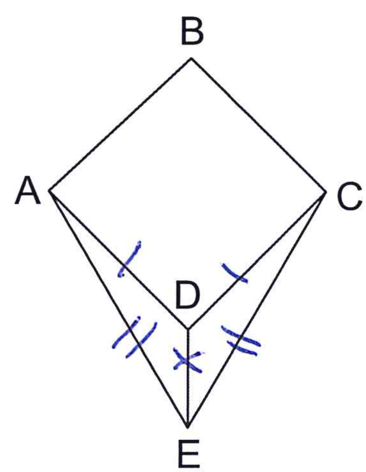
$$\begin{array}{r} 180 \\ -112 \\ \hline 68 \end{array}$$

11. Given: ABCD is a rectangle, M is the midpoint of $\overline{AC}$
Prove: $\overline{DM} \cong \overline{BM}$



Statements	Reasons
① ABCD is a rectangle	① given
② $\overline{DA} \cong \overline{BC}$	② A rectangle has opposite sides congruent
③ $\angle 1 \cong \angle 2$	③ A rectangle has congruent right angles
④ M is the midpoint of AC	④ given
⑤ $\overline{AM} \cong \overline{MC}$	⑤ A midpoint creates two congruent segments
⑥ $\triangle DAM \cong \triangle BCM$	⑥ SAS≅SAS
⑦ $\overline{DM} \cong \overline{BM}$	⑦ CPCTC

12. Given: ABCD is a rhombus, $\overline{AE} \cong \overline{CE}$
Prove: $\angle ADE \cong \angle CDE$



Statements	Reasons
① ABCD is a rhombus	① given
② $\overline{AD} \cong \overline{DC}$	② A rhombus has all sides ≅
③ $\overline{AE} \cong \overline{CE}$	③ given
④ $\overline{DE} \cong \overline{DE}$	④ reflexive property
⑤ $\triangle ADE \cong \triangle CDE$	⑤ SSS≅SSS
⑥ $\angle ADE \cong \angle CDE$	⑥ CPCTC

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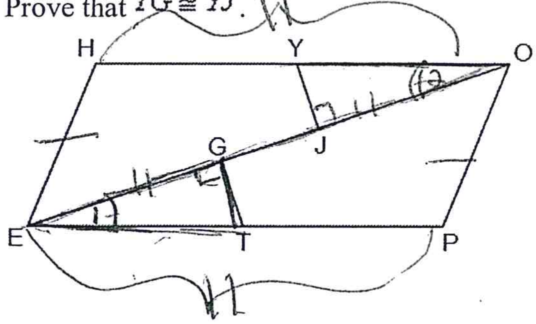
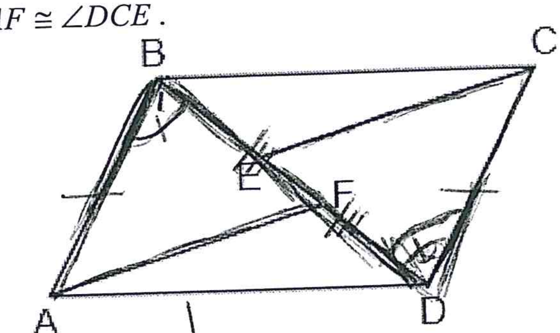
Parallelogram Proofs Part IV

13. In quadrilateral *HOPE* below, $\overline{EH} \cong \overline{OP}$, $\overline{EP} \cong \overline{OH}$, $\overline{EJ} \cong \overline{OG}$, and $\overline{TG}$ and $\overline{YJ}$ are perpendicular to diagonal $\overline{EO}$ at points *G* and *J*, respectively. Prove that $\overline{TG} \cong \overline{YJ}$.



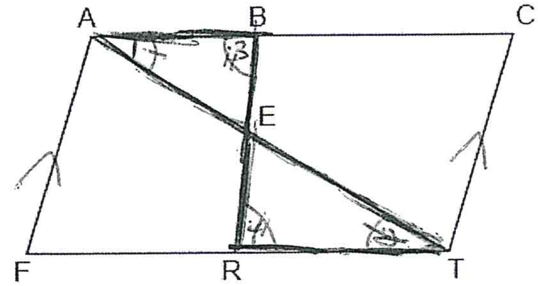
Statements	Reasons
1) $\overline{EH} \cong \overline{OP}$; $\overline{EP} \cong \overline{OH}$	1) given
2) HOPE is a p-gram	2) A parallelogram has two pairs of opposite sides congruent
3) $\angle 1 \cong \angle 2$	3) A parallelogram has parallel lines cut by a transversal which create congruent alternate interior angles.
4) $\overline{EJ} \cong \overline{OG}$	4) given
5) $\overline{GJ} \cong \overline{GJ}$	5) reflexive property
6) $\overline{EG} \cong \overline{OJ}$ or $EJ - GJ = OG - GJ$	6) subtraction property
7) $\overline{TG} \perp \overline{EO}$, $\overline{YJ} \perp \overline{EO}$	7) given
8) $\angle TGE \cong \angle YJO$	8) Perpendicular lines form congruent right angles
9) $\triangle TGE \cong \triangle YJO$	9) ASA ≅ ASA
10) $\overline{TG} \cong \overline{YJ}$	10) CPCTC

14. In the diagram of quadrilateral *ABCD* below, $\overline{AB} \cong \overline{CD}$, and $\overline{AB} \parallel \overline{CD}$. Segments *CE* and *AF* are drawn to diagonal $\overline{BD}$ such that $\overline{BE} \cong \overline{DF}$. Prove: $\angle BAF \cong \angle DCE$.



Statements	Reasons
1) $\overline{AB} \cong \overline{CD}$, $\overline{AB} \parallel \overline{CD}$	1) given
2) ABCD is a p-gram	2) A p-gram has 1 pair of opposite sides congruent and parallel
3) $\angle 1 \cong \angle 2$	3) Parallelogram has parallel lines cut by a transversal which create congruent alt int ∠s
4) $\overline{AB} \cong \overline{CD}$	4) A parallelogram has opposite sides congruent
5) $\overline{BE} \cong \overline{DF}$	5) given
6) $\overline{EF} \cong \overline{EF}$	6) reflexive property
7) $\overline{BF} \cong \overline{ED}$	7) addition property
~~8) △ABF ≅ △~~ ~~△ABF ≅ △DCE~~	
8) $\triangle ABF \cong \triangle CDE$	8) SAS ≅ SAS
9) $\angle BAF \cong \angle DCE$	9) CPCTC

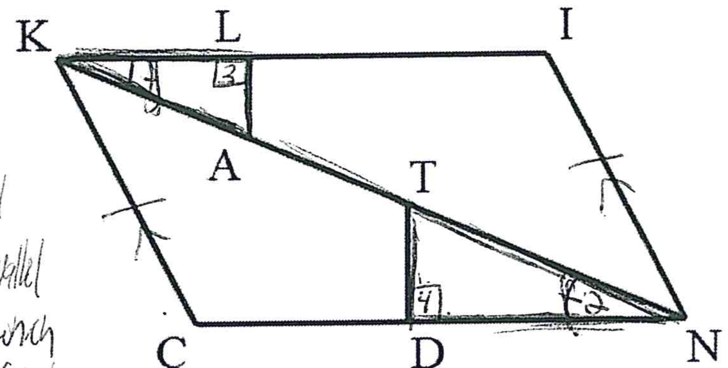
15 ~~8~~. In the diagram below of quadrilateral $FACT$, $\overline{BR}$ intersects diagonal $\overline{AT}$ at E, $\overline{AF} \parallel \overline{CT}$, and $\overline{AF} \cong \overline{CT}$. Prove $(AB)(TE) = (AE)(TR)$



Statements	Reasons
① $\overline{AF} \parallel \overline{CT}, \overline{AF} \cong \overline{CT}$	① given
② FACT is a parallelogram	② A p-gram has 1 pair of opposite sides ≅ and ∥
③ $\angle 1 \cong \angle 2, \angle 3 \cong \angle 4$	③ A parallelogram has parallel lines cut by a transversal creating congruent alternate interior angles
④ $\triangle ABE \sim \triangle TRE$	④ AA≅AA
⑤ $\frac{AB}{TR} = \frac{AE}{TE}$	⑤ CSSTIP
⑥ $(AB)(TE) = (AE)(TR)$	⑥ cross products are equal

*you could have done vertical angles

16 ~~10~~. Given: $\overline{KC} \parallel \overline{IN}$, $\overline{KC} \cong \overline{IN}$, $\overline{AL} \perp \overline{KI}$, $\overline{TD} \perp \overline{CN}$. Prove $\overline{KL} \bullet \overline{NT} = \overline{DN} \bullet \overline{KA}$



Statements	Reasons
① $\overline{KC} \parallel \overline{IN}, \overline{KC} \cong \overline{IN}$	① given
② KINC is a p-gram ~~has 1 pair of opposite sides con~~	② A P-gram has 1 pair of opposite sides congruent and parallel
③ $\angle 1 \cong \angle 2$	③ A Parallelogram has parallel lines cut by a transversal which form congruent alternate interior angles
④ $\overline{AL} \perp \overline{KI}, \overline{TD} \perp \overline{CN}$	④ given
⑤ $\angle 3 \cong \angle 4$	⑤ Perpendicular lines form congruent right angles
⑥ $\triangle KLA \sim \triangle NDT$	⑥ AA≅AA
⑦ $\frac{KL}{KA} = \frac{DN}{NT}$	⑦ CSSTIP
⑧ $\overline{KL} \cdot \overline{NT} = \overline{DN} \cdot \overline{KA}$	⑧ cross products are equal