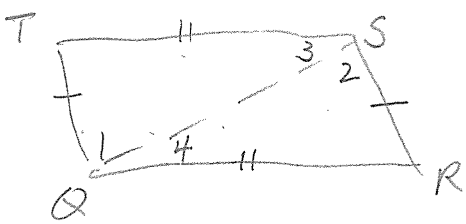
Theorem Proofs: Proving quads are ▱s.

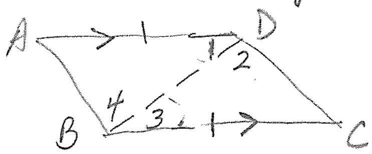
Thm: If both pairs of opp. sides of quad $\cong \rightarrow$ ▱.



① $\overline{TS} \cong \overline{QR}$
$\overline{TQ} \cong \overline{SR}$
② $\overline{QS} \cong \overline{QS}$
$\rightarrow$ ③ $\triangle TQS \cong \triangle RSQ \rightarrow$ ④ $\angle 1 \cong \angle 2 \rightarrow$ ⑤ $\overline{TQ} \parallel \overline{SR}$
$\angle 3 \cong \angle 4 \rightarrow$ $\overline{TS} \parallel \overline{QR}$
$\rightarrow$ ⑥ ▱ QRST

① Given
② Reflexive Prop
③ SSS Thm
④ CPCTC
⑤ 2 lines w/ alt. int. $\angle$s $\cong \rightarrow \parallel$ lines
⑥ 2 prs opp sides $\parallel \rightarrow$ ▱.

Thm: If one pr. opp sides of quad. $\cong$ and $\parallel \rightarrow$ ▱.



① $\overline{AD} \parallel \overline{BC} \rightarrow$ ② $\angle 1 \cong \angle 3$
③ $\overline{AD} \cong \overline{BC}$
④ $\overline{BD} \cong \overline{BD}$
$\rightarrow$ ⑤ $\triangle ADB \cong \triangle CBD \rightarrow$ ⑥ $\angle 4 \cong \angle 2 \rightarrow$ ⑦ $\overline{AB} \parallel DC$

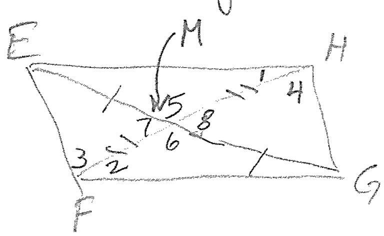
⑧ Quad ABCD is ▱.

① Given
② 2 $\parallel$ lines $\rightarrow$ alt. int. $\angle$s $\cong$.
③ Given
④ Reflexive Prop.
⑤ SAS Thm
⑥ CPCTC
⑦ 2 lines w/ alt. int. $\angle$s $\cong \rightarrow$ 2 $\parallel$ lines
⑧ 2 prs. opp sides $\parallel \rightarrow$ ▱.

Thm: 2 prs of opp $\angle$s of quad $\cong$ $\rightarrow$ ▱

Statements	Reasons
① $x + y + x + y = 360$	① sum of meas. of quad $= 360$
② $2(x+y) = 360$	② Distributive Prop ← use for PARCC (see Book)
③ $x + y = 180$	③ Division Prop
④ $\angle A$ and $\angle D$ supp; $\angle A$ and $\angle B$ supp	④ Suppl. $\angle$s are 2 $\angle$s that total 180.
⑤ $\overline{AB} \parallel \overline{CD}$, $\overline{BC} \parallel \overline{AD}$	⑤ 2 lines w/ alt. int $\angle$s $\cong$ $\rightarrow$ 2 $\parallel$ lines
⑥ ABCD is ▱.	⑥

Thm: Diag bisect each other $\rightarrow$ ▱.



① $\overline{EG}$ and $\overline{HF}$ bisect each other. $\rightarrow$ ② $\overline{EM} \cong \overline{MG}$, $\overline{FM} \cong \overline{MH}$

③ $\angle 5 \cong \angle 6$

$\rightarrow$ ④ $\triangle EMH \cong \triangle GMF$

⑤ $\angle 1 \cong \angle 2$ $\rightarrow$ ⑥ $\overline{EH} \parallel \overline{FG}$

⑦ $\angle 7 \cong \angle 8$ $\rightarrow$ ⑧ $\triangle EFM \cong \triangle GHM$ $\rightarrow$ ⑨ $\angle 3 \cong \angle 4$ $\rightarrow$ ⑩ $\overline{EF} \parallel \overline{HG}$

⑪ EFGH is ▱.

① Given

② segmt bisector $\div$ segmt into 2 $\cong$ parts.

③ Vertical $\angle$s $\cong$.

④ SAS thm

⑤ CPCTC

⑥ 2 lines w/ alt. int $\angle$s $\cong$ $\rightarrow$ 2 $\parallel$ lines.

⑦ Vertical $\angle$s $\cong$.

⑧ SAS thm

⑨ CPCTC

⑩ 2 lines w/ alt. int $\angle$s $\cong$ $\rightarrow$ 2 $\parallel$ lines.

⑪ 2 prs. opp sides $\parallel$ $\rightarrow$ ▱.