

Conditions for Parallelograms HW & Practice KEY

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- ① Yes opp sides \cong ② Yes, 1 pr. opp sides \cong & \parallel
③ No ④ Yes, diag bisect each other
⑤ NO ⑥ Yes, opp \angle s \cong
⑦ Yes, opp prs sides \parallel . ⑧ No ⑨ Yes, opp \angle s \parallel .

⑫ Since $EF = Hg$ and $HE = GF$, $EFGH$ is \square and $\overline{HG} \parallel \overline{EF}$.

⑬ The dashed lines shown bisect each other, so the quad formed by their endpoints is a \square . The pairs are \parallel to 2 opp sides of the \square .

- ⑩ Def of $\square \rightarrow$ opp sides \parallel . ⑬ Diag. bisect each other
⑪ opp sides \cong (both prs) ⑭ both prs opp \angle s \cong
⑫ 1 pr. sides \cong & \parallel

⑮ The diag. bisect each other \rightarrow $ABDR$ is a $\square \rightarrow \overline{AR} \parallel \overline{BD}$

⑰ $x = 18$
 $y = 14$

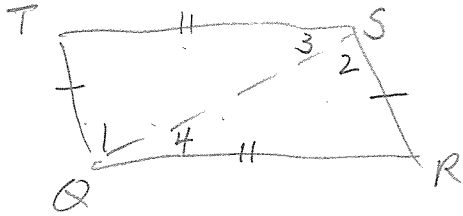
⑳ $x = 20$
 $y = 6$
or $y = -5$

㉑ $x = 10$
 $y = 2$

㉒ $x = 11$
 $y = 5$

Theorem Proofs: Proving quads are \square 's.

⑩ Thm: If both pairs of opp. sides of quad $\cong \rightarrow \square$.



$$\left. \begin{array}{l} \textcircled{1} \overline{TS} \cong \overline{QR} \\ \overline{TQ} \cong \overline{SR} \\ \textcircled{2} \overline{QS} \cong \overline{QS} \end{array} \right\} \rightarrow \textcircled{3} \triangle TQS \cong \triangle RSQ \rightarrow \left. \begin{array}{l} \textcircled{4} \angle 1 \cong \angle 2 \\ \angle 3 \cong \angle 4 \end{array} \right\} \rightarrow \left. \begin{array}{l} \textcircled{5} \overline{TQ} \parallel \overline{SR} \\ \overline{TS} \parallel \overline{QR} \end{array} \right\} \rightarrow \textcircled{6} \square QRST$$

① Given

④ CPCTC

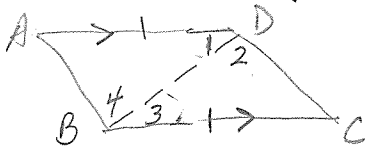
② Reflexive Prop

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

③ SSS Thm

⑥ 2 pairs opp sides $\parallel \rightarrow \square$.

⑪ Thm: If one pair opp sides of quad. \cong and $\parallel \rightarrow \square$.



$$\left. \begin{array}{l} \textcircled{1} \overline{AD} \parallel \overline{BC} \rightarrow \left. \begin{array}{l} \textcircled{2} \angle 1 \cong \angle 3 \\ \textcircled{3} \overline{AD} \cong \overline{BC} \\ \textcircled{4} \overline{AC} \cong \overline{CA} \end{array} \right\} \rightarrow \textcircled{5} \triangle ADC \cong \triangle CBA \rightarrow \left. \begin{array}{l} \textcircled{6} \angle 4 \cong \angle 2 \\ \textcircled{7} \overline{AB} \parallel \overline{DC} \end{array} \right\} \end{array} \right\} \rightarrow \textcircled{8} \text{Quad } ABCD \text{ is } \square.$$

① Given

⑤ SAS Thm

② 2 \parallel lines \rightarrow alt. int. \angle s \cong .

⑥ CPCTC

③ Given

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

④ Reflexive Prop.

⑧ 2 pairs opp sides $\parallel \rightarrow \square$.

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

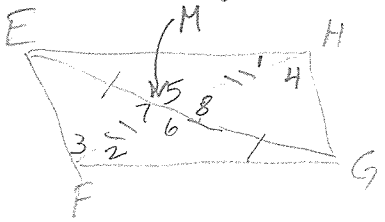
Statements

Reasons

- | | |
|---|---|
| ① $x + y + x + y = 360$ | ① Sum of meas. of quad = 360 |
| ② $2(x + y) = 360$ | ② Distributive Prop \leftarrow 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 lines |
| ⑥ ABCD is \square . | ⑥ |

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⑱ Thm: Diagonals bisect each other $\rightarrow \square$



- ① \overline{EG} and \overline{HF} bisect each other. \rightarrow ② $\overline{EM} \cong \overline{MG}$
 $\overline{FM} \cong \overline{MH}$ \rightarrow ④ $\triangle EMH \cong \triangle GMF$
- ③ $\angle 5 \cong \angle 6$
- 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 \square .

- | | |
|--|--|
| ① Given | ⑥ 2 lines w/ alt. int \angle s $\cong \rightarrow$ 2 lines. |
| ② Segment bisector \div
segment into 2 \cong parts. | ⑦ Vertical \angle s \cong . |
| ③ Vertical \angle s \cong . | ⑧ SAS Thm |
| ④ SAS Thm | ⑨ CPCTC |
| ⑤ CPCTC | ⑩ 2 lines w/ alt. int \angle s $\cong \rightarrow$ 2 lines. |
| | ⑪ 2 prs. opp sides $\rightarrow \square$. |