Proving congruence: Student worksheet

http://topdrawer.aamt.edu.au/Geometry/Misunderstandings/Similar-or-congruent/Complete-the-congruence-proof

Complete these proofs, putting in the reasons and missing angles.
Mark the equal angles and sides you find on the diagram as you go.

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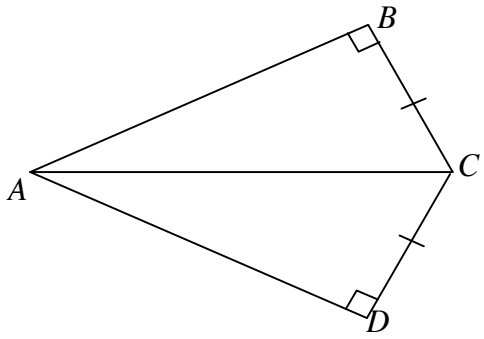
1. Given: $BC = DC$; $AB \perp BC$ and $CD \perp DA$
   Aim: To prove $\Delta ABC \equiv \Delta ADC$



Proof:
In ΔABC and ΔADC
1. $\angle B = \angle D$
   ( )
2. AC is common
   ( )
3. $BC = DC$
   $\therefore$ $\Delta ABC \equiv \Delta ADC$ ( )

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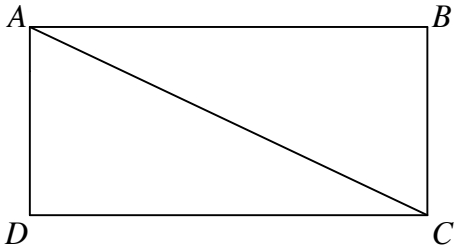
2. Given: ABCD is a rectangle
   Aim: To prove $\Delta ABC \equiv \Delta ADC$



Proof:
In ΔABC and ΔADC
1. $AB = DC$
   ( )
2. $AD = BC$
   ( )
3. AC
   $\therefore$ $\Delta ABC \equiv \Delta ADC$ ( )

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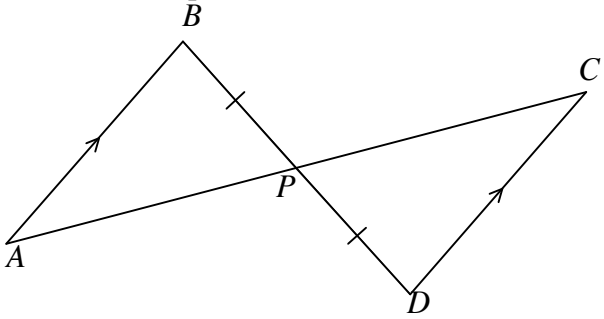
3. Given: $AB \parallel DC$ and $BP = PD$
   Aim: To prove $\Delta ABP \equiv \Delta CDP$



Proof:
In ΔABP and ΔCDP
1. $\angle A = \angle C$
   ( )
2. $\angle APB = \angle DPC$
   ( )
3. $BP = PD$
   ( )
   $\therefore$ $\Delta ABP \equiv \Delta CDP$ ( )

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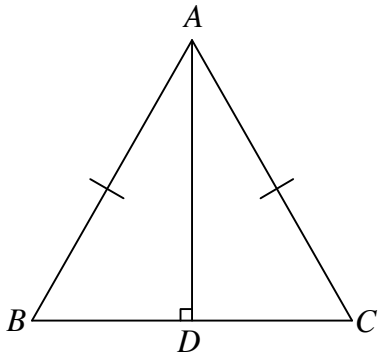
4. Aim: To prove $BD = DC$



Proof:
In ΔABD and ΔACD

1. $\angle$ $= \angle$
   ( )
2. $=$
   ( )
3. $=$
   ( )

$\therefore \Delta ABD \equiv \Delta ACD$ ( )

$\therefore BD = CD$
( )

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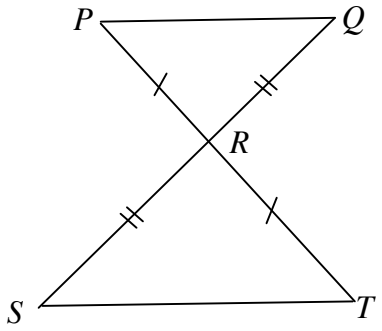
5. Aim: To prove $PQ \parallel ST$



Proof:
In ΔPQR and ΔSTR

1. $=$
   ( )
2. $\angle$ $= \angle$
   ( )
   $=$
   ( )

$\therefore \Delta PQR \equiv \Delta$ ( )

$\therefore$ $=$
( )
But these are
_____ angles

$\therefore PQ \parallel ST$
( )

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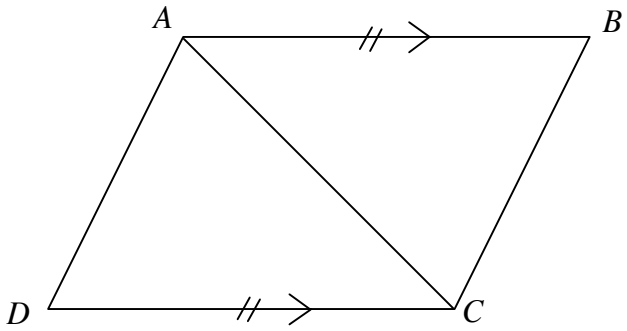
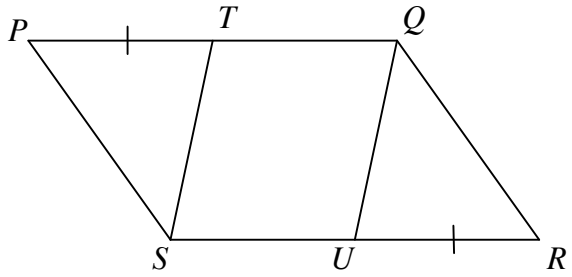
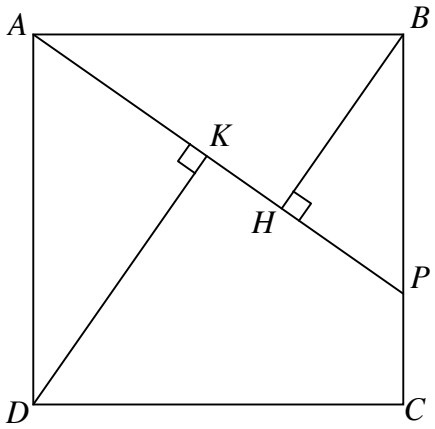
6. Aim: To prove $\angle B = \angle D$



7. Given: $PQRS$ is a parallelogram. $PT = RU$.
   Aim: To prove $TS = QU$



8. Given: $ABCD$ is a square.
   $BH \perp AP$ and $DK \perp AP$.
   Aim: To prove $AH = DK$



Proof:
In ΔABH and ΔADK

1. $\angle AHB = \angle AKD = 90°$
   ( )
2. $\angle HAB + \angle ABH + \angle AHB = 180°$
   ( )

$\therefore \angle ABH = 90° - \angle HAB$
But $\angle DAK = 90° - \angle HAB$
( )

$\therefore \angle ABH = \angle DAK$

3. $AB = AD$
   ( )

$\therefore \Delta ABH \equiv \Delta DAK$ ( )

$\therefore AH = DK$
( )

9. Given: $ABCD$ and $AEFG$ are both squares.
   Aim: To prove $BE = DG$