

For each combination of relationships, determine whether a and d are parallel or perpendicular to each other.

1. $a \perp c$ and $c \parallel d$

2. If $a \parallel c$ and $c \parallel d$

3. $a \perp c$ and $c \perp d$

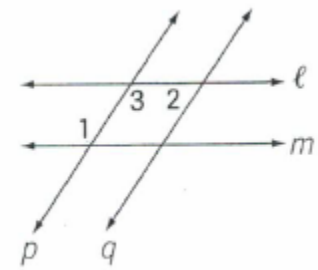
4. $a \perp b$, $b \parallel c$, $c \parallel d$

5. $a \perp b$, $b \parallel c$, $c \perp d$

Fill in the reason for each proof.

6. **Given:** $\ell \parallel m$; $\angle 1$ and $\angle 2$ are supplementary

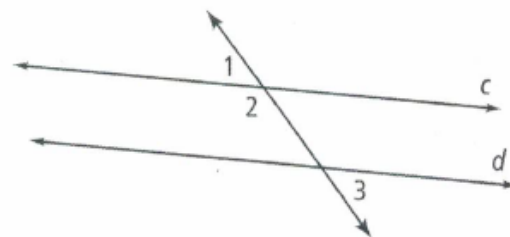
Prove: $p \parallel q$



Statements	Reasons
1. $\ell \parallel m$	1.
2. $\angle 1 \cong \angle 3$	2.
3. $m\angle 1 = m\angle 3$	3.
4. $\angle 1$ and $\angle 2$ are supplementary	4.
5. $\angle 3$ and $\angle 2$ are supplementary	5.
6. $p \parallel q$	6.

7. **Given:** $\angle 2$ and $\angle 3$ are supplementary.

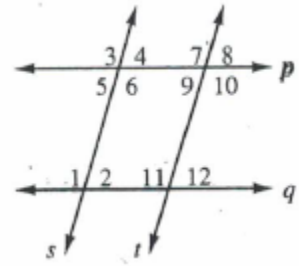
Prove: $c \parallel d$



Statements	Reasons
1. $\angle 2$ and $\angle 3$ are supplementary	1.
2. $\angle 1$ and $\angle 2$ are supplementary	2.
3. $\angle 1 \cong \angle 3$	3.
4. $c \parallel d$	4.

8. **Given:** $p \parallel q$ and $s \parallel t$

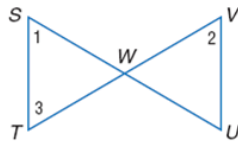
Prove: $\angle 9 \cong \angle 2$



Statements	Reasons
1. $p \parallel q$	1.
2. $\angle 9 \cong \angle 12$	2.
3. $s \parallel t$	3.
4. $\angle 12 \cong \angle 2$	4.
5. $\angle 9 \cong \angle 2$	5.

9. **Given:** $\angle 2 \cong \angle 1$ and $\angle 1 \cong \angle 3$

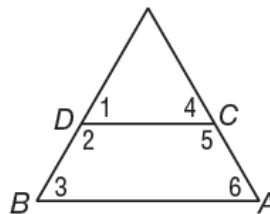
Prove: $ST \parallel VU$



Statements	Reasons
1. $\angle 2 \cong \angle 1$ and $\angle 1 \cong \angle 3$	1. Given
2. $\angle 2 \cong \angle 3$	2. _____
3. $ST \parallel VU$	3. _____

10. **Given:** $\angle 2$ & $\angle 3$ are supplementary

Prove: $\overline{AB} \parallel \overline{CD}$



Statements	Reasons
1. $\angle 2$ & $\angle 3$ are supplementary	1. Given
2. $\angle 1$ & $\angle 2$ are supplementary	2. _____
3. $\angle 1 \cong \angle 3$	3. _____
4. $\overline{AB} \parallel \overline{CD}$	4. _____