

Proving Lines are Parallel

Name Key

Block _____ Date _____

1. State the theorem or postulate that proves $a \parallel b$.

Theorem/Postulate:
Conv. Corr. \angle 's

2. State the theorem or postulate that proves $a \parallel b$.

Theorem/Postulate:
Conv. AIA

What is the value of y in order for $a \parallel b$?
 $y = 65$

3. Which lines or segments are parallel? State the theorem or postulate that justifies your answer.

$\overline{BE} \parallel \overline{CG}$

Theorem/Postulate:
Conv. Corr. \angle 's

4. Which lines or segments are parallel? State the theorem or postulate that justifies your answer.

$\overline{PS} \parallel \overline{QT}$

Theorem/Postulate:
Conv. Corr. \angle 's

5. Which lines or segments are parallel? State the theorem or postulate that justifies your answer.

$\overline{CA} \parallel \overline{HR}$

Theorem/Postulate:
Conv. Corr. \angle 's

6. Which lines or segments are parallel? State the theorem or postulate that justifies your answer.

$\overline{MT} \parallel \overline{KR}$

Theorem/Postulate:
Conv. Corr. \angle 's

7. Calculate the value of x for which $\ell \parallel m$.

$x + 25 = 55$
 $x = 30$

$x = 30$

8. Calculate the value of x for which $\ell \parallel m$.

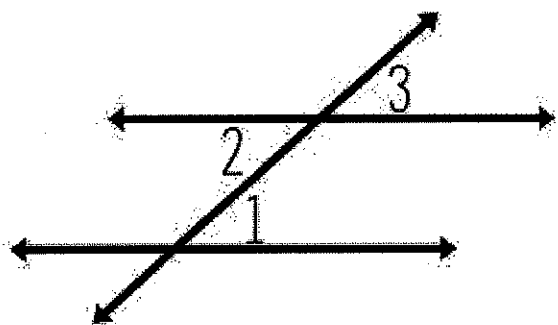
$2x - 5 = 95$
 $2x = 100$
 $x = 50$

$x = 50$

1

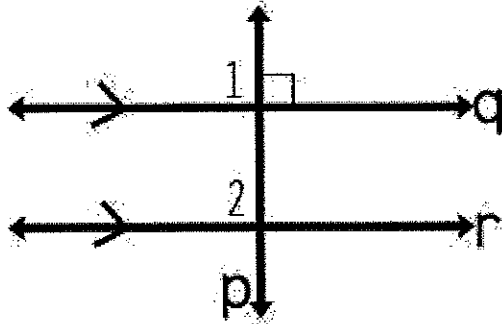
GIVEN: $\angle 1 \cong \angle 2$

PROVE: $m \parallel n$



statements	Reasons
① $\angle 1 \cong \angle 2$	① Given
② $\angle 2 \cong \angle 3$	② Vertical \angle 's
③ $\angle 1 \cong \angle 3$	③ Transitive / sub.
④ $m \parallel n$	④ Conv. corr. \angle 's

#2 given: $p \perp q$ and $q \parallel r$
PROVE: $p \perp r$

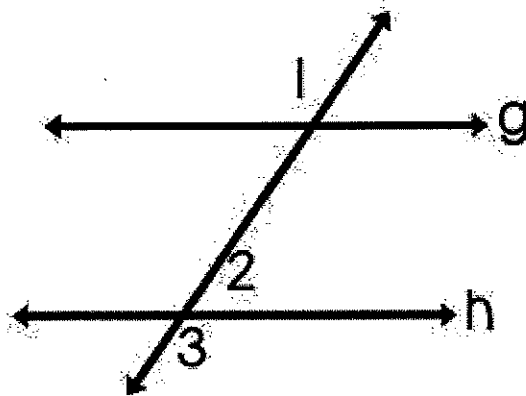


statements	Reasons
① $p \perp q$, $q \parallel r$	① Given
② $\angle 1 = 90$	② \angle 's are a linear pair
③ $\angle 1 \cong \angle 2$	③ Corr. \angle 's
④ $\angle 2 = 90$	④ substitution
⑤ $p \perp r$	⑤ Def. of perpendicular

#3

GIVEN: $\angle 1$ and $\angle 2$ are supplementary

PROVE: $g \parallel h$

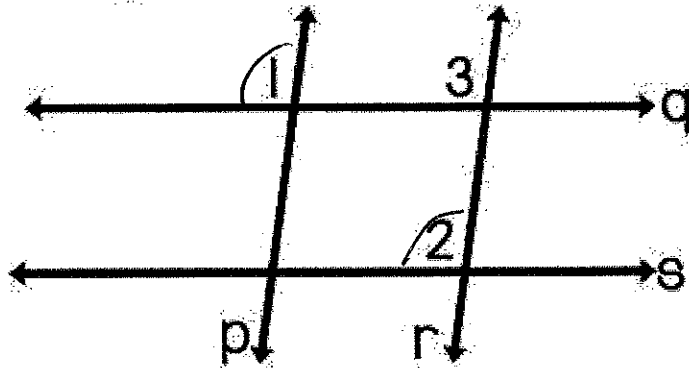


statements	Reasons
① $\angle 1$ & $\angle 2$ are supp.	① Given
② $\angle 1 + \angle 2 = 180$	② Def. Supp.
③ $\angle 2 + \angle 3 = 180$	③ Linear Pair
④ $\angle 1 + \angle 2 = \angle 2 + \angle 3$	④ substitution
⑤ $\angle 1 = \angle 3$	⑤ subtraction
⑥ $g \parallel h$	⑥ Conv. AEA

#4

GIVEN: $p \parallel r$ and $\angle 1 \cong \angle 2$

PROVE: $q \parallel s$

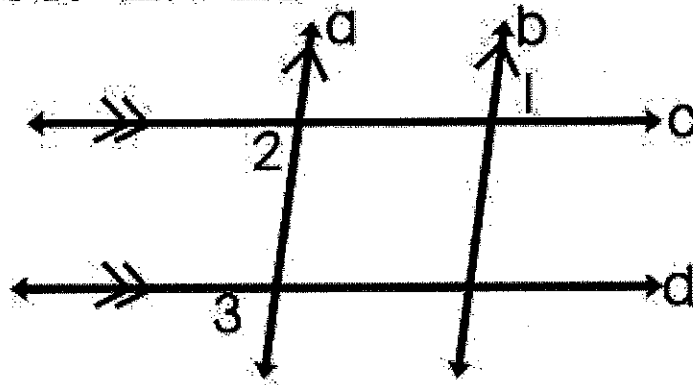


statements	Reasons
① $p \parallel r$, $\angle 1 \cong \angle 2$	① Given
② $\angle 1 \cong \angle 3$	② Corr. \angle 's
③ $\angle 2 \cong \angle 3$	③ Trans/sub.
④ $q \parallel s$	④ Conv. Corr. \angle 's

#5

GIVEN: $c \parallel d$ and $a \parallel b$

PROVE: $\angle 1 \cong \angle 3$

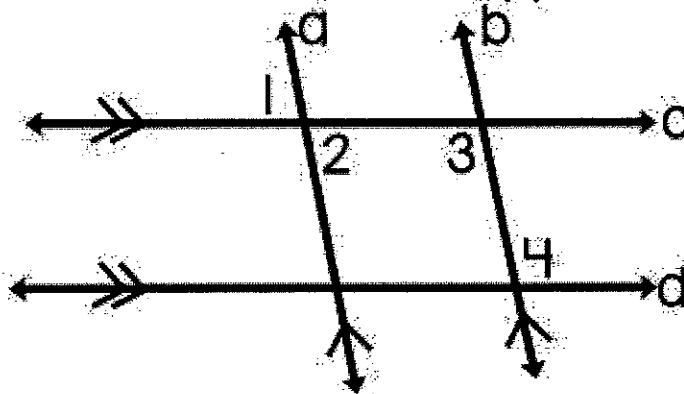


statements	REASONS
① $c \parallel d, a \parallel b$	① Given
② $\angle 2 \cong \angle 3$	② Corr. \angle 's
③ $\angle 1 \cong \angle 2$	③ AEA'S
④ $\angle 1 \cong \angle 3$	④ Trans/sub.

#6

GIVEN: $c \parallel d$ and $a \parallel b$

PROVE: $\angle 1$ and $\angle 4$ are supplementary

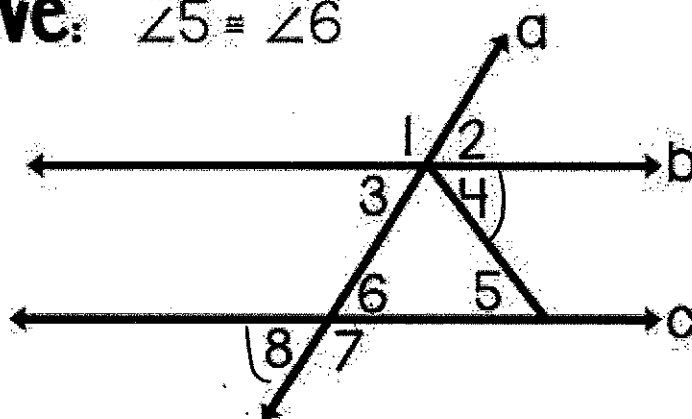


statements	Reasons
① $c \parallel d, a \parallel b$	① Given
② $\angle 1 \cong \angle 2$	② Vertical
③ $\angle 2 + \angle 3 = 180$	③ SSIL'S
④ $\angle 3 \cong \angle 4$	④ AIA
⑤ $\angle 1 + \angle 3 = 180$	⑤ Substitution
⑥ $\angle 1 + \angle 4 = 180$	⑥ Substitution
⑦ $\angle 1$ & $\angle 4$ are supp.	⑦ Def. supp.

#7

GIVEN: $b \parallel c$ and $\angle 4 \cong \angle 8$

PROVE: $\angle 5 \cong \angle 6$

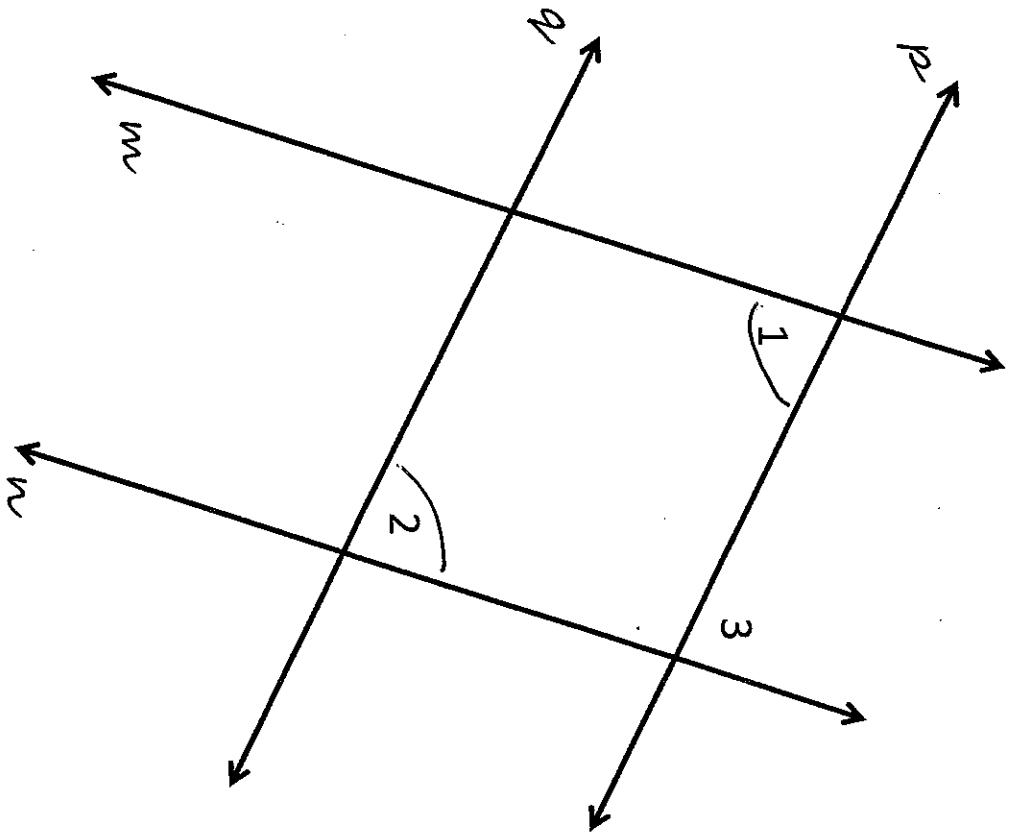


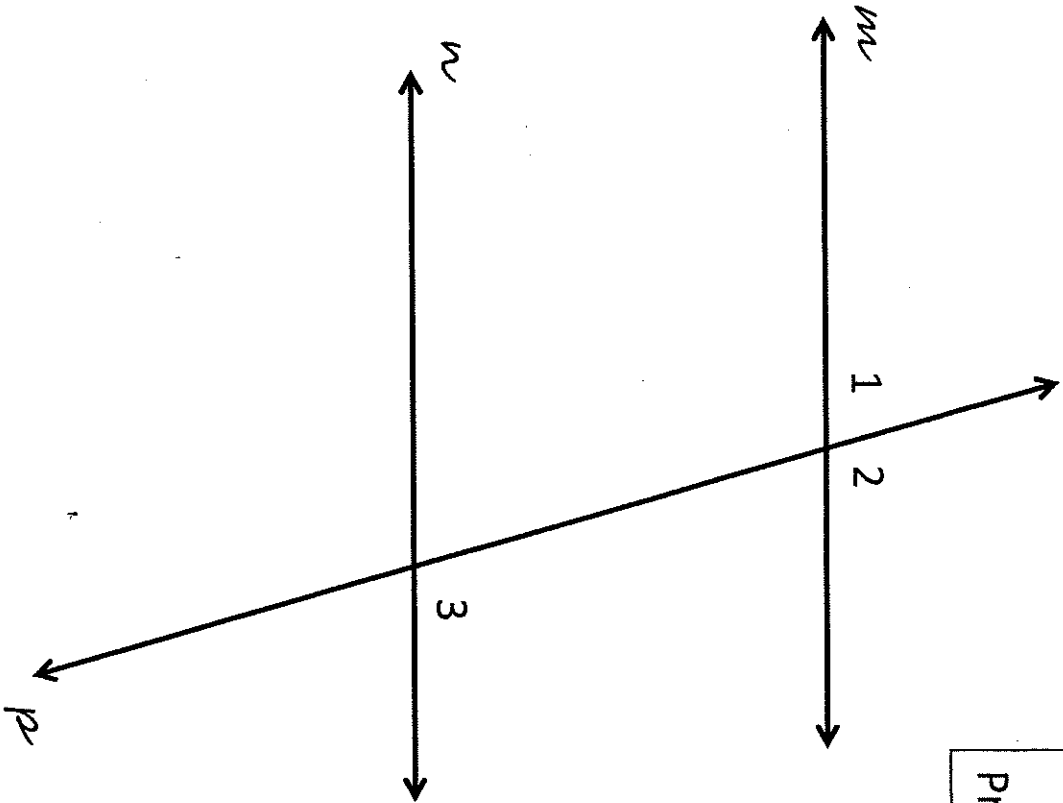
statements	Reasons
① $b \parallel c, \angle 4 \cong \angle 8$	① Given
② $\angle 2 \cong \angle 3$	② Vertical \angle 's
③ $\angle 3 \cong \angle 8$	③ Corr. \angle 's
④ $\angle 2 \cong \angle 8$	④ Trans/sub/ AEA's
⑤ $\angle 8 \cong \angle 6$	⑤ Vertical \angle 's
⑥ $\angle 4 \cong \angle 6$	⑥ substitution
⑦ $\angle 4 \cong \angle 5$	⑦ AIA
⑧ $\angle 5 \cong \angle 6$	⑧ Trans./sub.

Given: $p \parallel q$
 $\angle 1 \cong \angle 2$

Prove: $m \parallel n$

	Statement	Justification
1	$p \parallel q, \angle 1 \cong \angle 2$	GIVEN
2	$\angle 2 \cong \angle 3$	CORR. \angle 'S
3	$\angle 1 \cong \angle 3$	TRANS/SUB.
4	$m \parallel n$	CONV. AIA
5		
6		
7		
8		
9		
10		
11		
12		

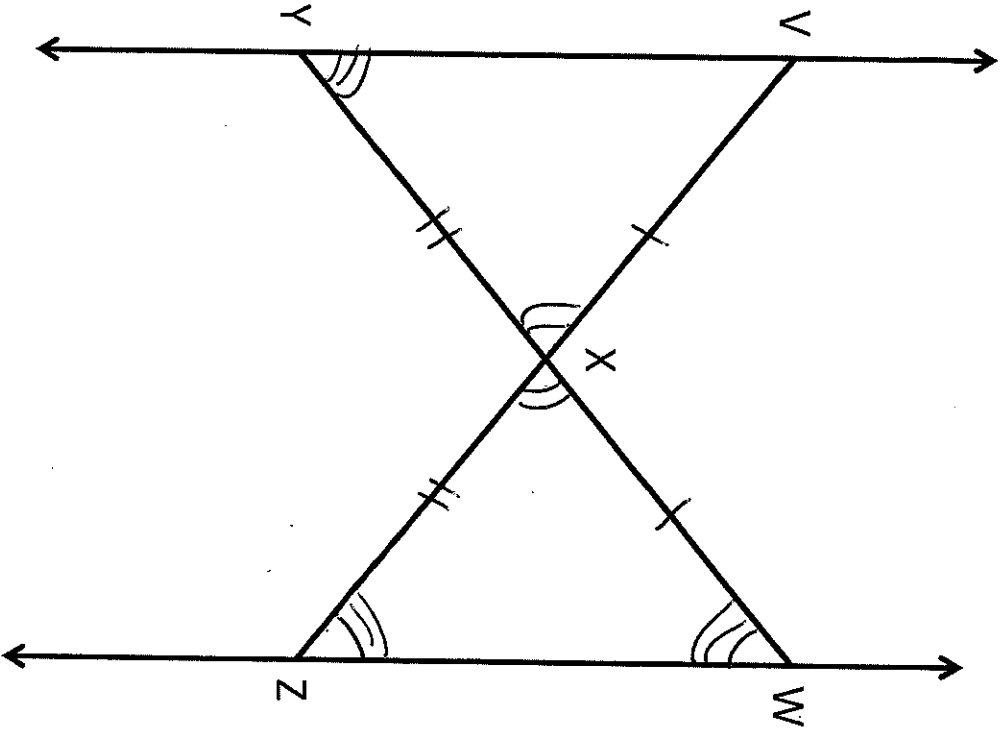




Given: $\angle 1$ and $\angle 3$ are supplementary.

Prove: $m \parallel n$

	Statement	Justification
1	$\angle 1 + \angle 3$ SUPP.	Given
2	$\angle 1 + \angle 3 = 180$	Def. Supp.
3	$\angle 1 + \angle 2 = 180$	Linear Pair
4	$\angle 1 + \angle 3 = \angle 1 + \angle 2$	Substitution
5	$\angle 3 = \angle 2$	Subtraction
6	$m \parallel n$	Conv. Corr. \angle 's
7		
8		
9		
10		
11		
12		



Given:

$$\overline{VX} \cong \overline{XW}$$

$$\overline{VY} \cong \overline{WZ}$$

$$\angle XWZ \cong \angle XZW$$

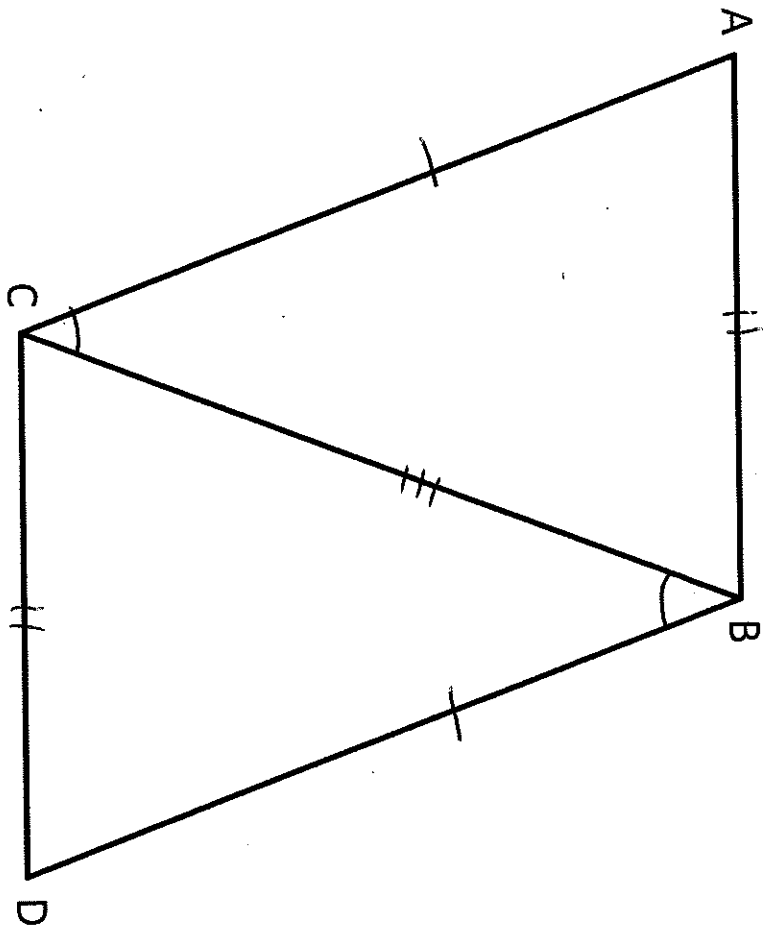
Prove:

$$\overline{VY} \parallel \overline{WZ}$$

	Statement	Justification
1	$\overline{VX} \cong \overline{XW}, \overline{VY} \cong \overline{WZ}$	GIVEN
2	$\angle XWZ \cong \angle XZW$	
3	$\angle WXZ \cong \angle YXZ$	Vertical \angle s
4	$\Delta WXZ \cong \Delta YXZ$	SAS
5	$\angle XYV \cong \angle XZW$	CPCTC
6	$\angle XZY \cong \angle XZW$	TRANS. / Sub.
7	$\overline{VY} \parallel \overline{WZ}$	Conv. AIA
8		
9		
10		
11		
12		

Given: $AC = BD$
 $AB = CD$

Prove: $\overline{AC} \parallel \overline{BD}$



	Statement	Justification
1	$\overline{AC} = \overline{BD}, \overline{AB} = \overline{CD}$	Given
2	$\overline{BC} \cong \overline{BC}$	Reflexive
3	$\triangle ABC \cong \triangle DCB$	SSS
4	$\angle ACB \cong \angle DBC$	CPCTC
5	$\overline{AC} \parallel \overline{BD}$	Conv. Alt \angle s
6		
7		
8		
9		
10		
11		
12		