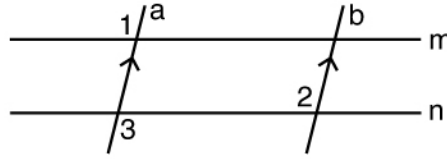


# Proofs of Angles and Parallel Lines

Prove the following

- 1) Given:  $m\angle 1 = m\angle 2$ ,  $a \parallel b$   
 Prove:  $m \parallel n$



**Statements**

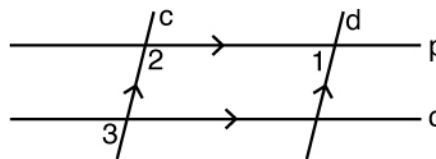
$m\angle 1 = m\angle 2$ ,  $a \parallel b$

**Reasons**

Given

Transitive property of congruence

- 2) Given:  $m\angle 1 + m\angle 3 = 180^\circ$ ,  $p \parallel q$   
 Prove:  $c \parallel d$



**Statements**

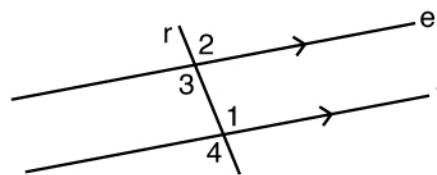
**Reasons**

Given

Corresponding angles postulate

Converse of the co-interior angles theorem

- 3) Given:  $e \parallel f$ ,  $r$  is transversal  
 Prove: a)  $m\angle 1 = m\angle 2$   
 b)  $m\angle 2 = m\angle 4$



- a) **Statements**

**Reasons**

Alternate interior angle theorem

Vertical angles theorem

- b) **Statements**

**Reasons**

$e \parallel f$ ,  $r$  is transversal

Given

Corresponding angles postulate

# Proofs of Angles and Parallel Lines

Answers

- 1) Given:  $m\angle 1 = m\angle 2$ ,  $a \parallel b$   
Prove:  $m \parallel n$



**Statements**

$m\angle 1 = m\angle 2$ ,  $a \parallel b$

$m\angle 2 = m\angle 3$

$m\angle 1 = m\angle 3$

$m \parallel n$

**Reasons**

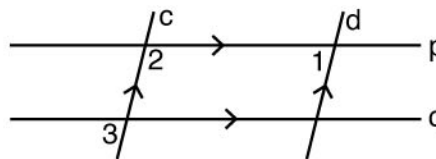
Given

Alternate interior angle theorem

Transitive property of congruence

Converse of alternate exterior angles theorem

- 2) Given:  $m\angle 1 + m\angle 3 = 180^\circ$ ,  $p \parallel q$   
Prove:  $c \parallel d$



**Statements**

$m\angle 1 + m\angle 3 = 180^\circ$ ,  $p \parallel q$

$m\angle 2 = m\angle 3$

$m\angle 1 + m\angle 2 = 180^\circ$

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

$c \parallel d$

**Reasons**

Given

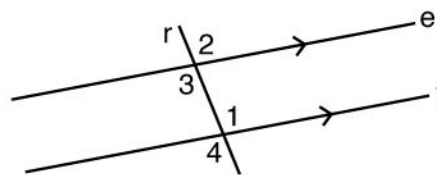
Corresponding angles postulate

Substitution property of equality

Definition of supplementary angles

Converse of the co-interior angles theorem

- 3) Given:  $e \parallel f$ ,  $r$  is transversal  
Prove: a)  $m\angle 1 = m\angle 2$   
b)  $m\angle 2 = m\angle 4$



- a) **Statements**

$e \parallel f$ ,  $r$  is transversal

$m\angle 1 = m\angle 3$

$m\angle 3 = m\angle 2$

$m\angle 1 = m\angle 2$

**Reasons**

Given

Alternate interior angle theorem

Vertical angles theorem

Transitive property of congruence

- b) **Statements**

$e \parallel f$ ,  $r$  is transversal

$m\angle 1 = m\angle 2$

$m\angle 1 = m\angle 4$

$m\angle 2 = m\angle 4$

**Reasons**

Given

Corresponding angles postulate

Vertical angles theorem

Transitive property of congruence