

Honors Geometry

Notes Section 2.6

Prove Statements about Segments & Angles

VOCABULARY

Proof: _____

Theorem: _____

THEOREM 2.1 (Congruence of Segments)

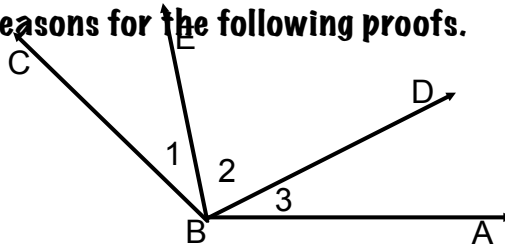
Segment congruence is Reflexive, Symmetric & Transitive.

THEOREM 2.2 (Congruence of Angles)

Angle congruence is Reflexive, Symmetric & Transitive

EXAMPLE 1 Complete the reasons for the following proofs.

- a) **Given:** $m\angle 1 = m\angle 3$
Prove: $m\angle EBA = m\angle DBC$



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|--|----------|
| 1. $m\angle 1 = m\angle 3$ | 1. _____ |
| 2. $m\angle EBA = m\angle 3 + m\angle 2$ | 2. _____ |
| 3. $m\angle EBA = m\angle 1 + m\angle 2$ | 3. _____ |
| 4. $m\angle 1 + m\angle 2 = m\angle DBC$ | 4. _____ |
| 5. $m\angle EBA = m\angle DBC$ | 5. _____ |

b) **Given:** $AC = AB + AB$
Prove: $AB = AC$

- | | |
|------------------------|----------|
| 1. $AC = AB + AB$ | 1. _____ |
| 2. $AB + BC = AC$ | 2. _____ |
| 3. $AB + AB = AB + BC$ | 3. _____ |
| 4. $AB = AC$ | 4. _____ |

EXAMPLE 2 Name the property illustrated.

- a) If $\angle R \cong \angle T$ and $\angle T \cong \angle P$, then $\angle R \cong \angle P$ _____
- b) If $NK = BD$, then $BD = NK$ _____
- c) $CD = CD$ _____

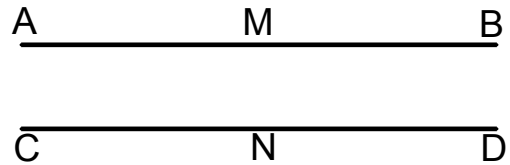
EXAMPLE 3 Complete the reasons for the following proofs.

a) **Given:** M is the Midpoint of AB
Prove: $AB = 2AM$
 $AM = 1/2AB$



- | | |
|--------------------------------|----------|
| 1. M is the Midpoint of AB | 1. _____ |
| 2. $AM \cong MB$ | 2. _____ |
| 3. $AM = MB$ | 3. _____ |
| 4. $AM + MB = AB$ | 4. _____ |
| 5. $AM + AM = AB$ | 5. _____ |
| 6. $2AM = AB$ | 6. _____ |
| 7. $AM = 1/2AB$ | 7. _____ |

b) **Given:** M is the Midpoint of AB
 N is the Midpoint of CD
 $AB = CD$
Prove: $AM = CN$



- | | |
|-------------------------------------|-----------|
| 1. M is the Midpoint of AB | 1. _____ |
| 2. N is the Midpoint of CD | 2. _____ |
| 3. $AB = CD$ | 3. _____ |
| 4. $AM \cong MB, CN \cong ND$ | 4. _____ |
| 5. $AM = MB, CN = ND$ | 5. _____ |
| 6. $AM + MB = AB$
$CN + ND = CD$ | 6. _____ |
| 7. $AM + AM = AB$
$CN + CN = CD$ | 7. _____ |
| 8. $2AM = AB, 2CN = CD$ | 8. _____ |
| 9. $2AM = 2CN$ | 9. _____ |
| 10. $AM = CN$ | 10. _____ |

b) **Given:** B is the Midpoint of AC
 C is the Midpoint of BD
Prove: $AB = CD$



- | | |
|--------------------------------|----------|
| 1. B is the Midpoint of AC | 1. _____ |
| 2. C is the Midpoint of BD | 2. _____ |
| 3. $AB \cong BC$ | 3. _____ |
| 4. $BC \cong CD$ | 4. _____ |
| 5. $AB \cong CD$ | 5. _____ |
| 6. $AB = CD$ | 6. _____ |