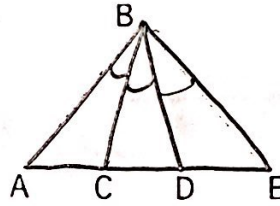


# Geometry Honors

## Proof Worksheet #6

Name Answer Key Period \_\_\_\_\_

Given:  $\overline{BC}$  bisects  $\angle ABD$   
 $\angle ABC \cong \angle DBE$

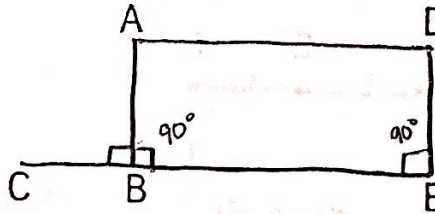


Prove:  $\overline{BD}$  bisects  $\angle CBE$

Statements	Reasons
① $\overline{BC}$ bisects $\angle ABD$ $\angle ABC \cong \angle DBE$ diagram	① Given
② $\angle ABC \cong \angle CBD$	② IF an $\angle$ is bisected then it is divided into 2 $\cong$ $\angle$ s
③ $\angle CBD \cong \angle DBE$	③ Substitution POC
④ $\overline{BD}$ bisects $\angle CBE$	④ IF a seg divides an $\angle$ into 2 $\cong$ $\angle$ s, then the seg bisects the $\angle$ .

Given:  $\overline{DE} \perp \overline{BE}$

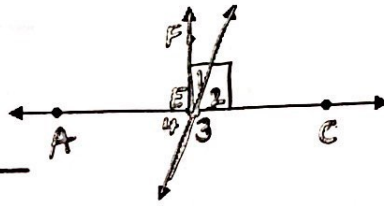
$$m\angle ABE = m\angle DEB$$



Prove:  $\angle ABC$  is a right angle

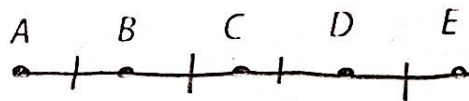
Statements	Reasons
① $\overline{DE} \perp \overline{BE}$ $m\angle ABE = m\angle DEB$ diagram	① Given
② $\angle DEB$ is a rt $\angle$	② IF segs are $\perp$ , then they form a rt $\angle$ .
③ $m\angle DEB = 90^\circ$	③ IF an $\angle$ is a rt $\angle$ , then its measure equals $90^\circ$
④ $m\angle ABE = 90^\circ$	④ Transitive POE
⑤ $\angle ABE$ is a rt $\angle$	⑤ IF an $\angle$ 's measure is $90^\circ$ , then it is a rt $\angle$
⑥ $\overline{AB} \perp \overline{CE}$	⑥ IF an $\angle$ is rt, then the segs that formed it are $\perp$
⑦ $\angle ABC$ is a rt $\angle$	⑦ IF segs are $\perp$ , then they form a rt $\angle$ .

Given:  $\angle FEC$  is a right angle  
 Prove:  $\angle 1$  and  $\angle 4$  are complementary



Statements	Reasons
① $\angle FEC$ is a rt $\angle$ diagram	① Given
② $\angle 1$ and $\angle 2$ are comp.	② If an $\angle$ is a rt $\angle$ , then the 2 adjacent $\angle$ s that formed it are comp.
③ $\angle 2$ and $\angle 4$ are vert $\angle$ s.	③ Assumed by diagram
④ $\angle 2 \cong \angle 4$	④ If $\angle$ s are vert. $\angle$ s, then they are $\cong$ .
⑤ $m\angle 2 = m\angle 4$	⑤ If $\angle$ s are $\cong$ , then their measures are =
⑥ $m\angle 1 + m\angle 2 = 90^\circ$	⑥ If $\angle$ s are comp., then their measures sum to $90^\circ$
⑦ $m\angle 1 + m\angle 4 = 90^\circ$	⑦ Substitution POE
⑧ $\angle 1$ and $\angle 4$ are comp.	⑧ If 2 $\angle$ measures sum to $90^\circ$ , then the $\angle$ s are comp.

Given: D is the midpoint of  $\overline{CE}$ ,  
 B is the midpoint of  $\overline{AC}$ ,  
 $\overline{AB} \cong \overline{DE}$   
 Prove:  $AE = 4AB$



Statements	Reasons
① D is the midpoint of $\overline{CE}$ B is the midpoint of $\overline{AC}$ $\overline{AB} \cong \overline{DE}$	① Given
② $\overline{CD} \cong \overline{DE}$ $\overline{AB} \cong \overline{BC}$	② If a pt is the midpoint, then it divides the seg into 2 $\cong$ segs
③ $AB + BC + CD + DE = AE$	③ Segment addition Postulate
④ $\overline{AB} = \overline{DE}$ , $\overline{CD} = \overline{DE}$ , $\overline{AB} = \overline{BC}$	④ If segs are $\cong$ , then their measures are =.
⑤ $AB + AB + CD + DE = AE$	⑤ Substitution POE
⑥ $AB + AB + DE + DE = AE$	⑥ Substitution POE
⑦ $AB + AB + AB + AB = AE$	⑦ Substitution POE
⑧ $4AB = AE$	⑧ Combine like terms
⑨ $AE = 4AB$	⑨ Symmetric POE