

Handout 4: Geometricky Proofs - Answers

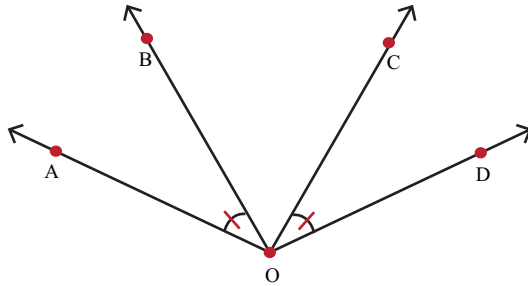


Figure 1

Given the Figure 1, prove that $\angle AOC \cong \angle BOD$ in questions 1-5.

1. What allows us to say that $\angle BOC \cong \angle BOC$?

Reflexive property of congruence

2. What allows us to say that $\angle AOB + \angle BOC = \angle COD + \angle BOC$?

Addition property of equality

3. What allows us to say that $\angle AOB + \angle BOC = \angle AOC$?

Angle addition postulate

4. What allows us to say that $\angle AOC = \angle BOD$?

Substitution property of equality

5. What allows us to say that $\angle AOC \cong \angle BOD$?

Definition of congruence (8).

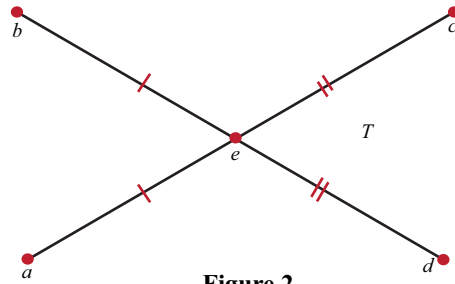


Figure 2

For questions 6-10, refer to Figure 2 and prove that E is the midpoint of \overline{BD} when given that E is the midpoint of \overline{AC} .

6. What allows us to say that $AE = CE$?

Definition of midpoint

7. What does applying the definition of congruence to $\overline{AE} \cong \overline{CE}$ tell us?

$AE = CE$.

8. We know that $AE = CE = BE$. What other length is the same as these three?

DE

9. Which two lengths are we interested in setting equal to each other?

$BE = DE$

10. If E is the midpoint of \overline{BD} , what must be true according to the definition of midpoint?

$\overline{BE} \cong \overline{DE}$