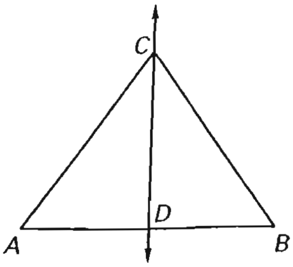
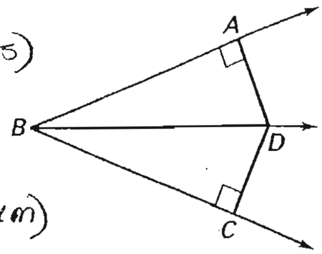
WS 31 - PBT

Use the diagram shown. CD is the perpendicular bisector of AB.



1. What is the relationship between AD and AB? ½ ~~equal~~ (bisects)
2. What is the relationship between $\angle ADC$ and $\angle BDC$? equal (90°)
3. What is the relationship between AC and CB? Explain. equal (⊥ bis)
4. *True or False?* Because $\overleftrightarrow{CD}$ is the perpendicular bisector of $\overline{AB}$, $\overline{AC} \cong \overline{AD}$. NO

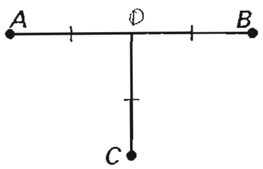
Use the diagram shown. $\overrightarrow{BD}$ is the angle bisector of $\angle ABC$.



5. What is the relationship between $\angle ABD$ and $\angle CBD$? equal (bisects)
6. What is the relationship between $\angle DAB$ and $\angle DCB$? equal (90°)
7. What is the relationship between AD and CD? Explain. equal (theorem)
8. *True or False?* Because $\overrightarrow{BD}$ is the angle bisector of $\angle ABC$, $\overline{AB} \cong \overline{CB}$. False (because of Angle Bisector, but true by CPCTC)

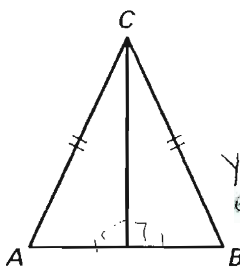
Tell whether the information in the diagram allows you to conclude that C is on the perpendicular bisector of AB. Explain your reasoning.

9.



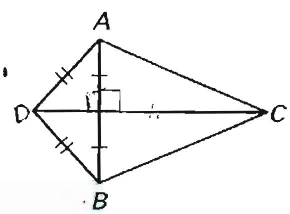
NO
Not rt ∡
(but AD = DB) (have to be 2 say)

10.



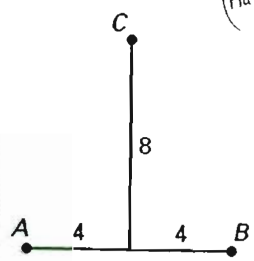
Yes
equidistant
(converse)

11.



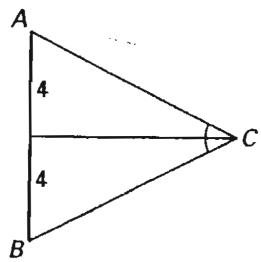
Yes
CA = CB if SAS
AD = DB

12.



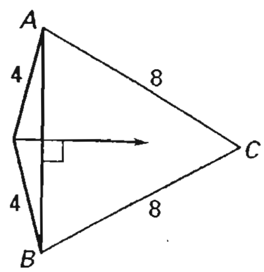
NO
No rt ∡

13.



NO
No rt ∡

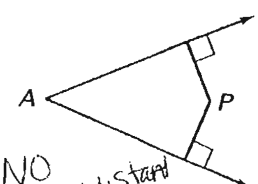
14.



Yes ⊥ + CA = CB

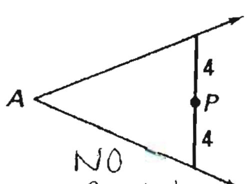
Tell whether the information in the diagram allows you to conclude that P is on the bisector of $\angle A$. Explain your reasoning.

15.



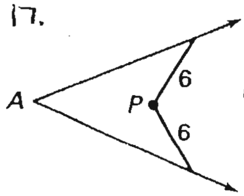
NO
? ≠ equidistant

16.



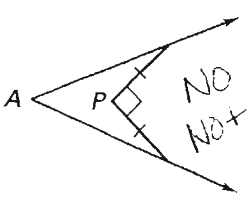
NO
P not ⊥

17.



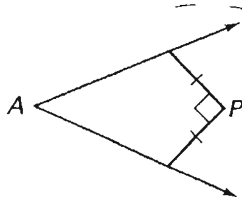
NO
P not ⊥

18.



NO
Not ⊥ to ray

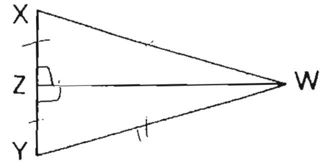
19.



NO not ⊥ to ray

bis. $\overline{XY}$

$\triangle WXY$ is isosceles. (Hint: This proof can be written in three steps by using Theorem 25.)

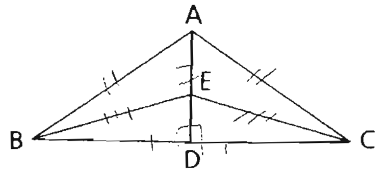


① Given
② WX = WY PBT
③ WXY is Isos Def Isos

WS 31 - PBT (back)

2) Given: $\overleftrightarrow{AD} \perp$ bis. $\overline{BC}$

Prove: $\triangle ABE \cong \triangle ACE$

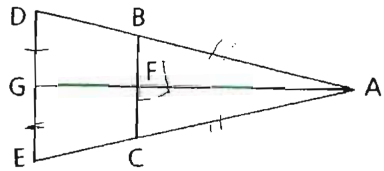


① Given
② $\overline{AB} \cong \overline{AC}$ PBT
$\overline{BE} \cong \overline{EC}$
③ AE = AE Reflexive
④ $\triangle \cong$ SSS

3) Given: $\overleftrightarrow{AG} \perp$ bis. $\overline{BC}$,

$\overleftrightarrow{AG} \perp$ bis. $\overline{DE}$

Conclusion: $\overline{BD} \cong \overline{CE}$



① Given
② AB = AC PBT
③ AD = AE PBT
④ BD = CE Subt

or ∠B = ∠C BAT

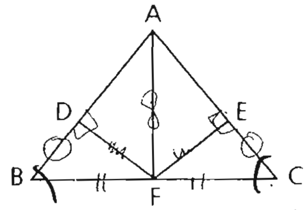
4) Given: F is the midpt. of $\overline{BC}$.

$\overline{DB} \cong \overline{EC}$,

$\overline{DB} \perp \overline{DF}$,

$\overline{EC} \perp \overline{EF}$

Conclusion: $\overleftrightarrow{AF} \perp \overleftrightarrow{BC}$

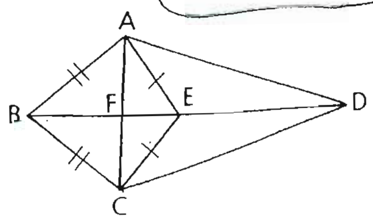


① Given ② ∆ Rt ∆s Def ⊥
③ ∆'s HL
④ DF = FE CPCTC
⑤ AF = AF Reflex
⑥ ∆'s HL.
⑦ ~~AD = AE CPCTC~~
⑧ ~~AB = AC Add.~~
⑨ PBT Cor AF ⊥ bis
⑩ AF ⊥ BC Def ⊥ bis

5) Given: $\overline{AB} \cong \overline{BC}$,

$\overline{AE} \cong \overline{EC}$

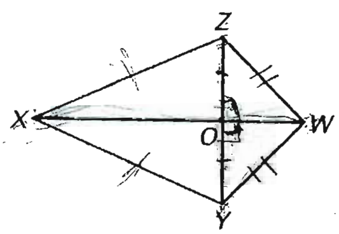
Prove: $\overline{AD} \cong \overline{DC}$ (Hint: This can be done in four steps.)



① Given
② $\overleftrightarrow{BD}$ is ⊥ bisector PBT Converse
③ $\overline{DA} \cong \overline{DC}$ Converse PBT.

6) **Given:** $\triangle WOZ \cong \triangle WOY$

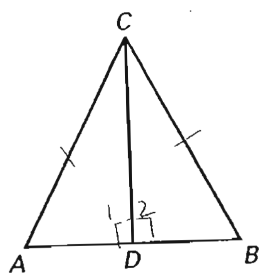
Prove: $\overline{XY} \cong \overline{XZ}$



① Given
② $\overline{WZ} \cong \overline{WY}$ CPCTC
③ $\overline{WX}$ is ⊥ bisector PBT Converse
$\overline{XY} \cong \overline{XZ}$ ~~Converse~~ PBT

7) **Given:** *C* is on the perpendicular bisector of $\overline{AB}$.

Prove: $\triangle ADC \cong \triangle BDC$

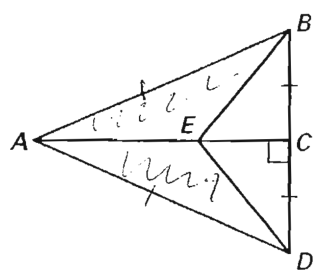


① Given
② CA = CB PBT
③ ∠1 + ∠2 rt ∠s Def PB
AD = DB
④ HL

(or Reflexive, SSS)

8) **Given:** $\overline{AC}$ is a perpendicular bisector of $\overline{BD}$.

Prove: $\triangle ABE \cong \triangle ADE$



① Given
② $\overline{AB} \cong \overline{AD}$ PBT
$\overline{EB} \cong \overline{ED}$ PBT
③ $\overline{AE} = \overline{AE}$ ~~SSS~~ Reflexive
④ SSS