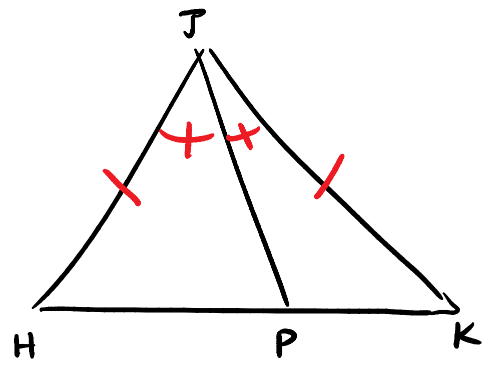
Section 5.1
pg 213: 2, 7, 10, 11, 12, 14

#2 Given: P is not the midpt of $\overline{HK}$
$\overline{HJ} \ncong \overline{JK}$

Prove: $\overrightarrow{JP}$ does not bisect $\measuredangle HJK$



Either $\overrightarrow{JP}$ bisects $\measuredangle HJK$ or $\overrightarrow{JP}$ does not bisect $\measuredangle HJK$

Assume: $\overrightarrow{JP}$ bisects $\measuredangle HJK$

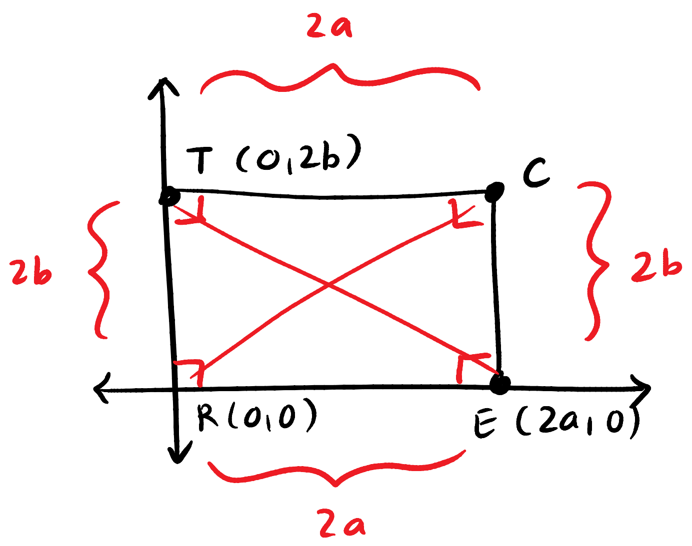
Then: ∴ $\measuredangle HJP \cong \measuredangle KJP$ (def of bisect)
$\overline{JP} \cong \overline{JP}$ (reflexive)
$\triangle HJP \cong \triangle KJP$ (SAS)
If $\triangle$'s $\cong$ → $\overline{HP} \cong \overline{PK}$ (CPCTC)

↳ But this contradicts the given that $\overline{HP} \ncong \overline{PK}$
∴ our assumption is false and $\overrightarrow{JP}$ does not bisect $\measuredangle HJK$

#7 RECT is a rectangle

a. In terms of a and b find the coordinates of C

(2a, 2b)

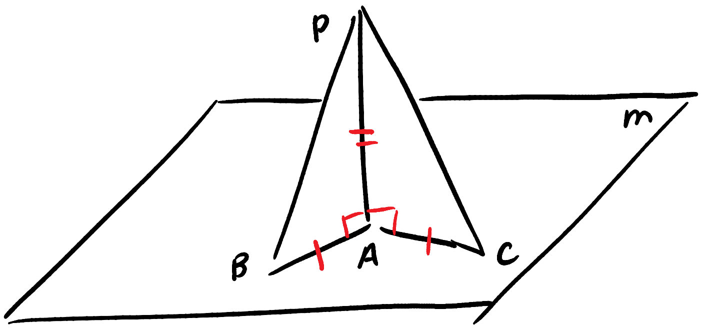


b. Does $\overline{RC}$ appear to be congruent to $\overline{ET}$

YES
(diagonals are $\cong$)

#10 Given: $\overline{PA} \perp \overline{AB}$
$\overline{PA} \perp \overline{PC}$
$\measuredangle B \ncong \measuredangle C$

Prove: $\overline{AB} \ncong \overline{AC}$



Either $\overline{AB} \cong \overline{AC}$ or $\overline{AB} \ncong \overline{AC}$

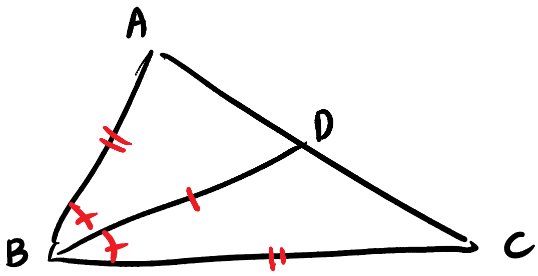
Assume: $\overline{AB} \cong \overline{AC}$

Then: $\overline{PA} \perp \overline{AB}$ so $\measuredangle PAB$ is a $\llcorner$
$\overline{PA} \perp \overline{PB}$ so $\measuredangle PAC$ is a $\llcorner$
$\measuredangle PAB \cong \measuredangle PAC$ ($\llcorner$'s $\cong$)
$\overline{PA} \cong \overline{PA}$ (reflexive)
$\triangle PAB \cong \triangle PAC$ (SAS)
$\measuredangle B \cong \measuredangle C$ (CPCTC)

↳ but this contradicts the given $\measuredangle B \ncong \measuredangle C$
∴ the assumption is false $\overline{AB} \ncong \overline{AC}$

#11 Given: $\overrightarrow{BD}$ bisects $\measuredangle ABC$
$\measuredangle ADB$ is acute

Prove: $\overline{AB} \ncong \overline{BC}$



Either: $\overline{AB} \cong \overline{BC}$ or $\overline{AB} \ncong \overline{BC}$

Assume: $\overline{AB} \cong \overline{BC}$

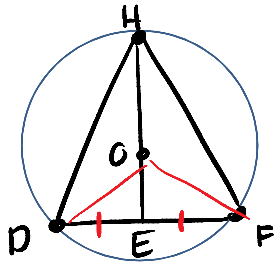
Then: $\overrightarrow{BD}$ bisects $\measuredangle ABC$ so $\measuredangle ABD \cong \measuredangle DBC$ (def of bisect)
$\overline{BD} \cong \overline{BD}$ (Reflexive prop)
$\triangle ABD \cong \triangle CBD$ (SAS)
$\measuredangle ADB \cong \measuredangle CDB$ (CPCTC)
$\measuredangle ADB$ and $\measuredangle CDB$ are right $\measuredangle$'s (supp + $\cong$)

↳ but this contradicts the given $\measuredangle ADB$ is acute
∴ the assumption is false and $\overline{AB} \ncong \overline{BC}$

12 Given: $\odot O$

$\overline{HE}$ is not the $\perp$ bisector of $\overline{DF}$

Prove: $\overline{DE} \ncong \overline{EF}$



Either $\overline{DE} \cong \overline{EF}$ or $\overline{DE} \ncong \overline{EF}$

Assume: $\overline{DE} \cong \overline{EF}$

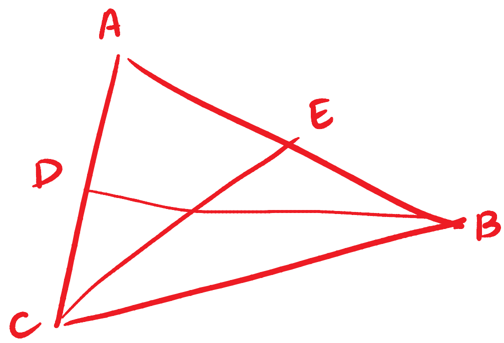
Then: Draw $\overline{OD}$ and $\overline{OF}$ (2 pts determine a line)

$\overline{OD} \cong \overline{OF}$ (All radii $\cong$)

$\overline{HE}$ is the $\perp$ bis. of $\overline{DF}$ (If 2 pts are equidistant from the endpts of a seg then they determine the $\perp$ bis of the seg)

↳ but given that $\overline{HE}$ is not the $\perp$ bis of $\overline{DF}$ so the assumption is false and $\overline{DE} \ncong \overline{DF}$

14 Prove that if 2 medians of a Δ are congruent, then the triangle is scalene



Given: $\overline{DB}$ is a median

$\overline{CE}$ is a median

$\overline{DB} \ncong \overline{CE}$

Prove: ΔABC is Scalene

Either ΔABC is scalene or ΔABC is not scalene

Assume: ΔABC is not scalene

Then: If it is not scalene then it is isos w/ base $\overline{CB}$

so $\overline{AB} \cong \overline{AC}$ (legs $\cong$)

$\angle ACB \cong \angle ABC$ (base $\angle$'s $\cong$)

D and E are midpts (DB and CE medians)

continued ↓

$\overline{DC} \cong \overline{EB}$ (division prop)

$\overline{BC} \cong \overline{BC}$ (reflexive prop)

$\Delta DCB \cong \Delta EBC$ (SAS)

$\overline{DB} \cong \overline{CE}$ (CPCTC)

↳ but the given says $\overline{DB} \ncong \overline{CE}$, so ΔABC is scalene

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