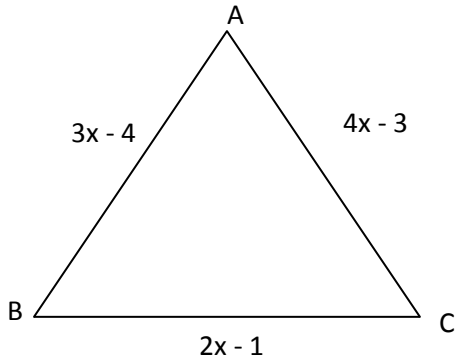
Geometry Honors **Name:**
3.6 and proof practice

1) Triangle ABC is isosceles. Which side is the base?



$3x-4=4x-3$
$-1=x$
NO!

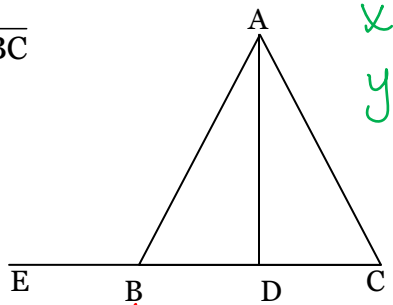
$4x-3=2x-1$
$2x=2$
$x=1$
NO!

$3x-4=2x-1$
$x=3$
5, 5, 9
yes!

2) Given: $\overline{AD}$ is an altitude to $\overline{BC}$

$\overline{AD}$ is a median to $\overline{BC}$
BD = 40
DC = x + 2y
$m\angle C = (4x-7)^\circ$
$m\angle B = (y^2)^\circ$

Find x, y, and the $m\angle ABE$

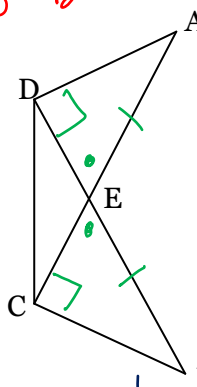


$x+2y=40 \rightarrow x=40-2y$
$y^2=4x-7$
$y^2=160-8y-7=153-8y$
$y^2+8y-153=0$
$(y+17)(y-9)=0$
$y=9,\ x=22,\ m\angle ABE=99^\circ$

Eliminate $y=-17$ because it makes $\angle B$ too large!

3) Given: $\overline{AC} \perp \overline{BC}$
$\overline{BD} \perp \overline{AD}$
$\overline{AE} \cong \overline{BE}$

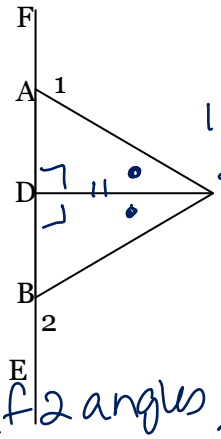
Prove: Triangle ECD is isosceles



Statements	Reasons
1. $\overline{AE} \perp \overline{BC}$	1. Given
2. $\overline{BD} \perp \overline{AD}$	2. Given
3. $\overline{AE} \cong \overline{BE}$	3. Given
4. $\angle ADE$ is rt, $\angle BCE$ is rt	4. If $\perp \rightarrow$ forms rt
5. $\angle ADE \cong \angle BCE$	5. If 2 rt $\rightarrow \cong$
6. $\angle AED \cong \angle BEC$	6. vertical angles are $\cong$
7. $\triangle AED \cong \triangle BEC$	7. AAS (6, 5, 3)
8. $\overline{ED} \cong \overline{EC}$	8. CPCTC
9. $\triangle ECD$ is isosceles	because if a $\triangle$ has at least 2 sides $\cong \rightarrow$ isos.

4) Given: $\overline{CD}$ bisects $\angle ACB$
$\overline{DC} \perp \overline{AB}$

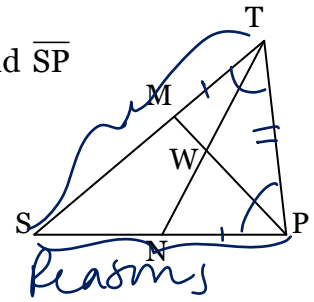
Prove: $\angle 1 \cong \angle 2$



Statements	Reasons
1. $\overline{CD}$ bisects $\angle ACB$	1. Given
2. $\overline{DC} \perp \overline{AB}$	2. Given
3. $\angle ACD \cong \angle DCB$	3. If a segment bisects an angle, then it $\cong$ it into 2 $\cong$ angles.
4. $\overline{CD} \cong \overline{CD}$	4. Reflexive
5. $\angle ADC$ is $\perp$, $\angle BDC$ is $\perp$	5. def $\perp$ → form $\perp$
6. $\angle ADC \cong \angle BDC$	6. def $\perp$ → $\cong$
7. $\triangle ADC \cong \triangle BDC$	7. ASA (6, 4, 3)
8. $\angle CAD \cong \angle CBD$	8. CPCTC
9. $\angle FAD$ is st. $\angle DBE$ is st.	9. Assumed
10. $\angle 1$ supp $\angle CAD$, $\angle 2$ supp $\angle CBD$	10. If 2 angles form a st. $\angle$, then supp.
11. $\angle 1 \cong \angle 2$	11. If 2 angles are supp to $\cong$ angles, then $\cong$.

5) Given: $\angle STP \cong \angle SPT$
M and N are midpoints of $\overline{ST}$ and $\overline{SP}$
$\overline{ST} \cong \overline{SP}$

Prove: $\overline{NT} \cong \overline{MP}$



Statements	Reasons
1. $\angle STP \cong \angle SPT$	1. Given
2. $\overline{ST} \cong \overline{SP}$	2. Given
3. M + N are midpts of $\overline{ST}$ and $\overline{SP}$	3. Given
4. $\overline{MT} \cong \overline{NP}$	4. If 2 segments are $\cong$, then their $\frac{1}{2}$'s are $\cong$.
5. $\overline{TP} \cong \overline{TP}$	5. Reflexive property
6. $\triangle MTP \cong \triangle NPT$	6. SAS (5, 1, 4)
7. $\overline{NT} \cong \overline{MP}$	7. CPCTC