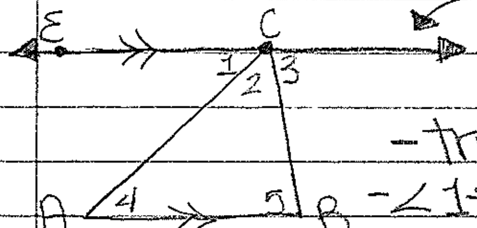
9·28·16

♡

Triangle Sum Conjecture:



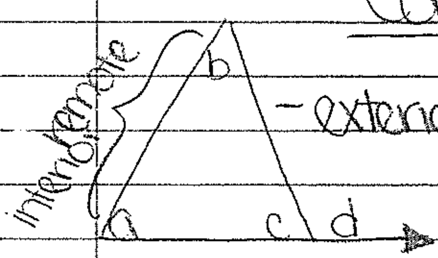
axiliary line

- trying to prove $\angle 2 + \angle 4 + \angle 5 = 180°$
- $\angle 1 + \angle 2 + \angle 3 = 180°$
- $\angle 1$ & $\angle 4$ are alternate interior $\angle$'s
- $\angle 3$ & $\angle 5$ are alternate interior $\angle$'s

By definition of a linear set of angles, $m\angle 1 + m\angle 2 + m$ 180°. Next, we know $m\angle 1 = m\angle 4$ by alternate interior $\angle$ conjecture. Also $m\angle 3 = m\angle 5$ by alternate interior $\angle$ conjecture. By substitution, $m\angle 4 + m\angle 2 + m\angle 5 = 180°$. Therefore, the Triangle sum conjecture is true.

Triangle Sum Conjecture: All the interior angles sum to 180°.

Conjecture Activity:



- exterior angle conjecture

$\angle a + \angle b = \angle d$

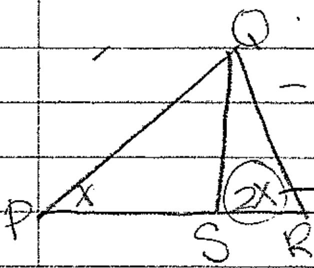
we know:

$\angle a + \angle b + \angle c = 180$ △ Sum

$c + d = 180$ Linear pair

$d = 180 - c$ & $a + b = 180 - c$

$d = a + b$ by Transitive



- Isoceles triangle

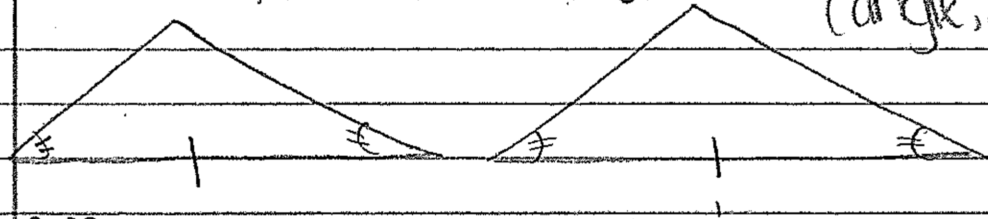
Why △PQS is isosceles

2x → Exterior angle to △PQS

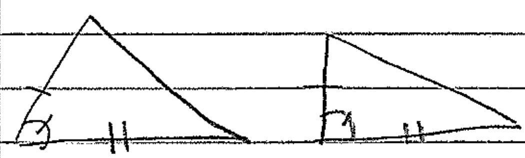
Triangle Congruence Shortcuts

ASA conjunctyre ~ if 2 ∠'s & the included side of 1 Δ are ≅ to 2 ∠'s & the included side of another Δ, then the Δ's are ≅

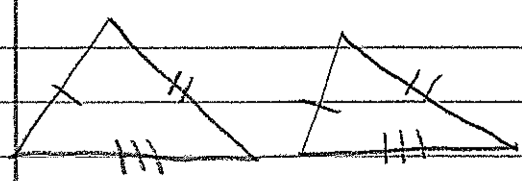
(angle, side, angle)



SAS conjecture ~ if 2 sides & an included ∠ of 1 Δ are ≅ to 2 sides & the included ∠ of another Δ then the 2 Δ's are ≅



SSS conjecture ~ if 3 sides of a Δ are ≅ to 3 sides of another Δ, then the 2 Δ's are congruent



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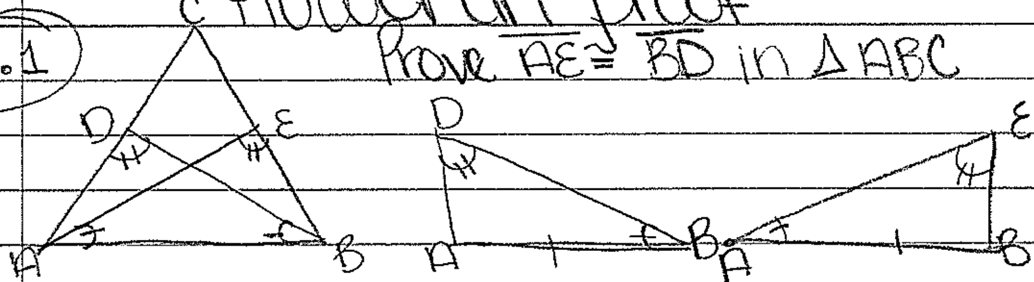
Flowchart proof

Ex. 1

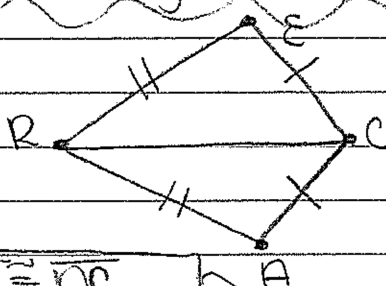
Prove $\overline{AE} \cong \overline{BD}$ in $\triangle ABC$



Paragraph proof

In $\triangle ADB$ & $\triangle BEA$, we know $\angle D \cong \angle E$, $\angle B \cong \angle A$ because it's given. Also, $\overline{AB} \cong \overline{BA}$ because they're the same side.
$\triangle ADB \cong \triangle BEA$ by AAS
$\overline{AE} \cong \overline{BD}$ by CPCTC

Ex. 2



Given ~ $\overline{EC} \cong \overline{AC}$ & $\overline{ER} \cong \overline{AR}$
Prove $\angle E \cong \angle A$

Flowchart proof

$\boxed{\overline{EC} \cong \overline{AC}}$
given

$\boxed{\overline{ER} \cong \overline{AR}}$ → $\boxed{\triangle CER \cong \triangle CAR}$ → $\boxed{\angle E \cong \angle A}$
given — by SSS — by CPCTC

$\boxed{\overline{RC} \cong \overline{RC}}$
same side