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Exercise 7.2 SAS Criterion:

Example 4: Given below are measurements of some parts of two Δ 's. Examine whether the two Δ 's are congruent or not, by using SAS congruence rule. If the Δ 's are \cong , write them in symbolic form.

① ΔABC

② $AB = 7\text{cm}, BC = 5\text{cm}, \angle B = 50^\circ$

③ $AB = 2.5, AC = 4\text{cm}, \angle A = 60^\circ$

④ $BC = 6\text{cm}, AC = 4\text{cm}, \angle B = 35^\circ$

ΔDEF

① $DE = 5\text{cm}, EF = 7\text{cm}, \angle E = 50^\circ$

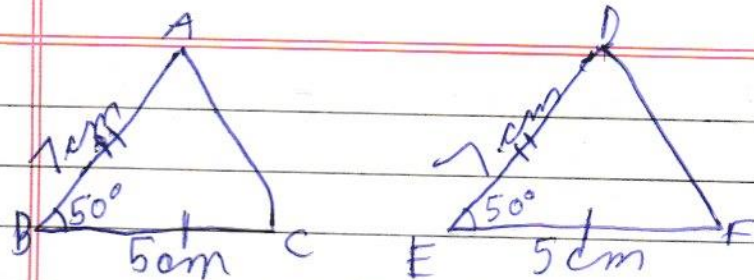
② $DE = 4\text{cm}, FD = 4.5\text{cm}, \angle D = 55^\circ$

③ $DF = 4\text{cm}, EF = 6\text{cm}, \angle E = 35^\circ$

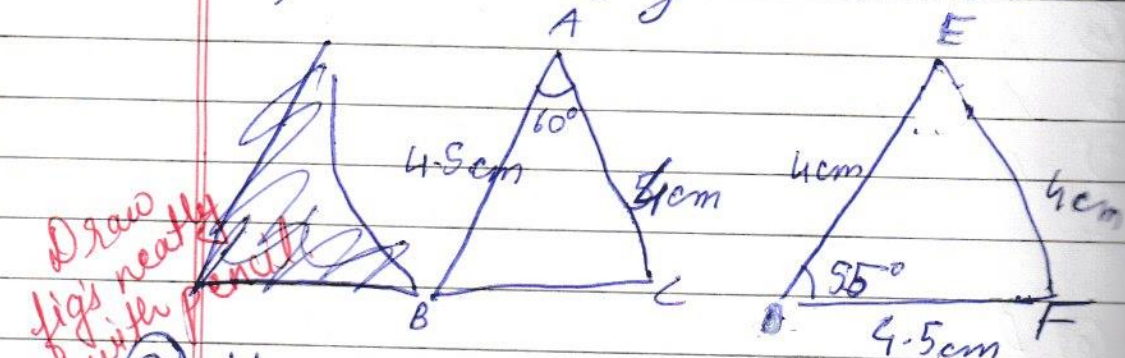
Solution:

① Here, $AB = EF (= 7\text{cm})$, $BC = DE (= 5\text{cm})$
and included $\angle B = \text{included } \angle E (= 50^\circ)$.
Also, $A \leftrightarrow F$, $B \leftrightarrow E$ and $C \leftrightarrow D$. $\therefore \Delta ABC \cong \Delta FED$ (By SAS congruence rule)

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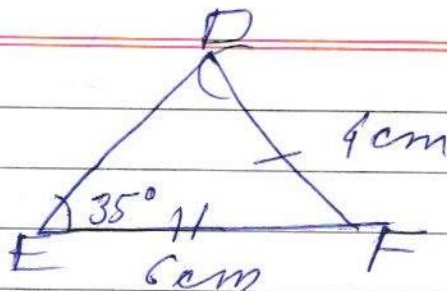
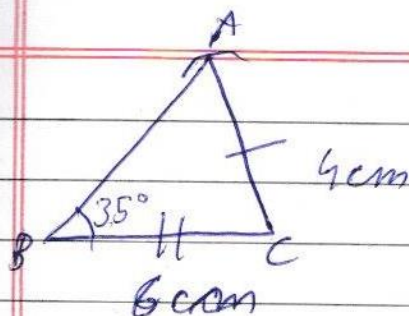
- (b) Here, $AB = FD$ and $AC = DE$
 But ~~the~~ included $\angle A \neq$ included $\angle D$.
 So, we cannot say that the Δ 's are \cong



Draw
figs neatly
and with pencil

- (c) Here, $BC = EF$, $AC = DF$ and $\angle B = \angle E$
 But $\angle B$ is not the included angle
 between the sides AC and BC .
 Similarly, $\angle E$ is not the included
~~and~~ \angle between the sides AC and BC
 EF and DF . So, SAS congruence rule
 cannot ~~be~~ be applied and we
 cannot conclude that the two Δ 's
 are \cong .

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Example 5: $AB = AC$ and AD is the bisector of $\angle BAC$.

- (i) State three pairs of equal parts are as follows:
- (ii) Is $\triangle ADB \cong \triangle ADC$? Give reasons.
- (iii) Is $\angle B = \angle C$? Give reason.

Solution:

- (i) The three pairs of equal parts are as follows:

$AB = AC$ (Given)

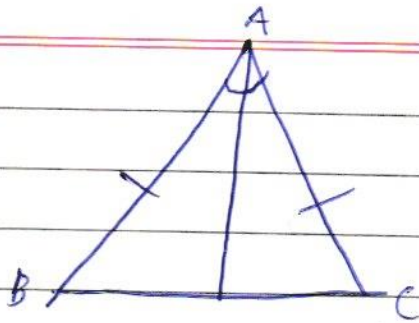
$\angle BAD = \angle CAD$ (AD bisects $\angle BAC$) and

$AD = AD$ (Common)

- (ii) Yes, $\triangle ADB \cong \triangle ADC$ (By SAS congruence rule)

- (iii) $\angle B = \angle C$ (Corresponding parts of $\cong \Delta$'s)

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Exercise 7.2 Try these:

(2.)

(i) in $\triangle ADB$ and $\triangle ADC$

$$\overline{AB} = \overline{AC} \rightarrow \text{given}$$

$$\overline{AD} = \overline{AD} \rightarrow \text{common}$$

$$\overline{BD} = \overline{DC} \rightarrow \text{AD is midpoint of BC}$$

(ii)

 $\triangle ADB \cong \triangle ADC \rightarrow \text{SSS congruence criterion}$

(iii)

 $\angle B = \angle C = \text{base angles are equal in isosceles } \triangle$