

4.3 Prove Triangles Congruent by SSS

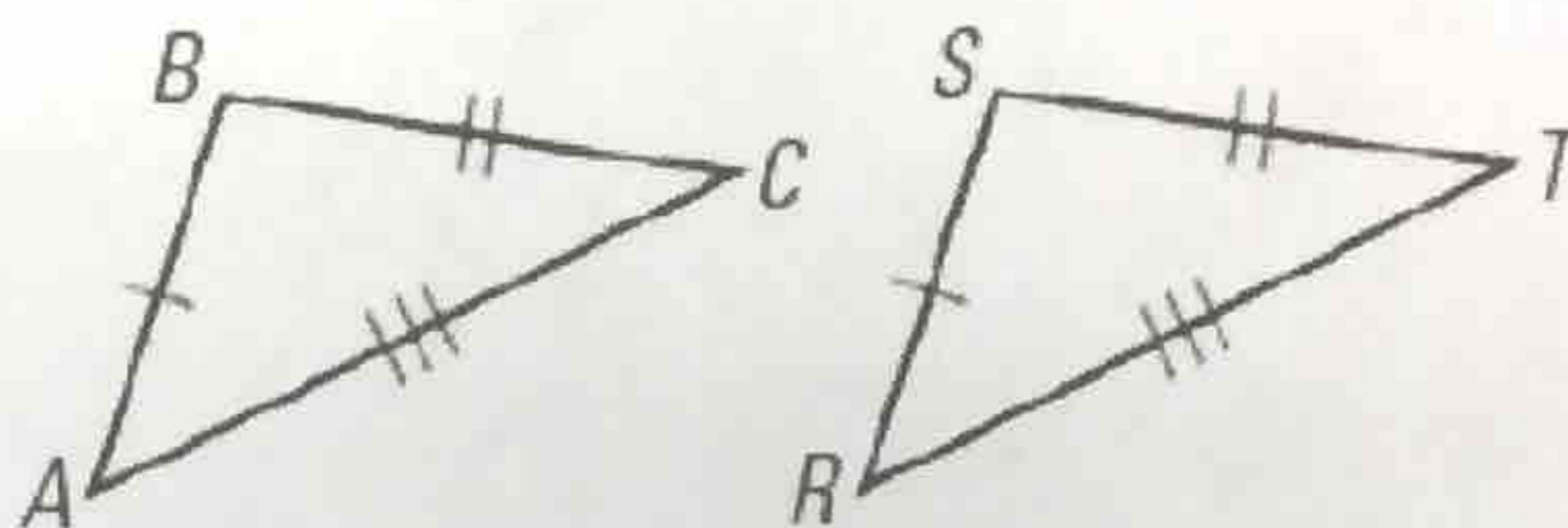
POSTULATE

For Your Notebook

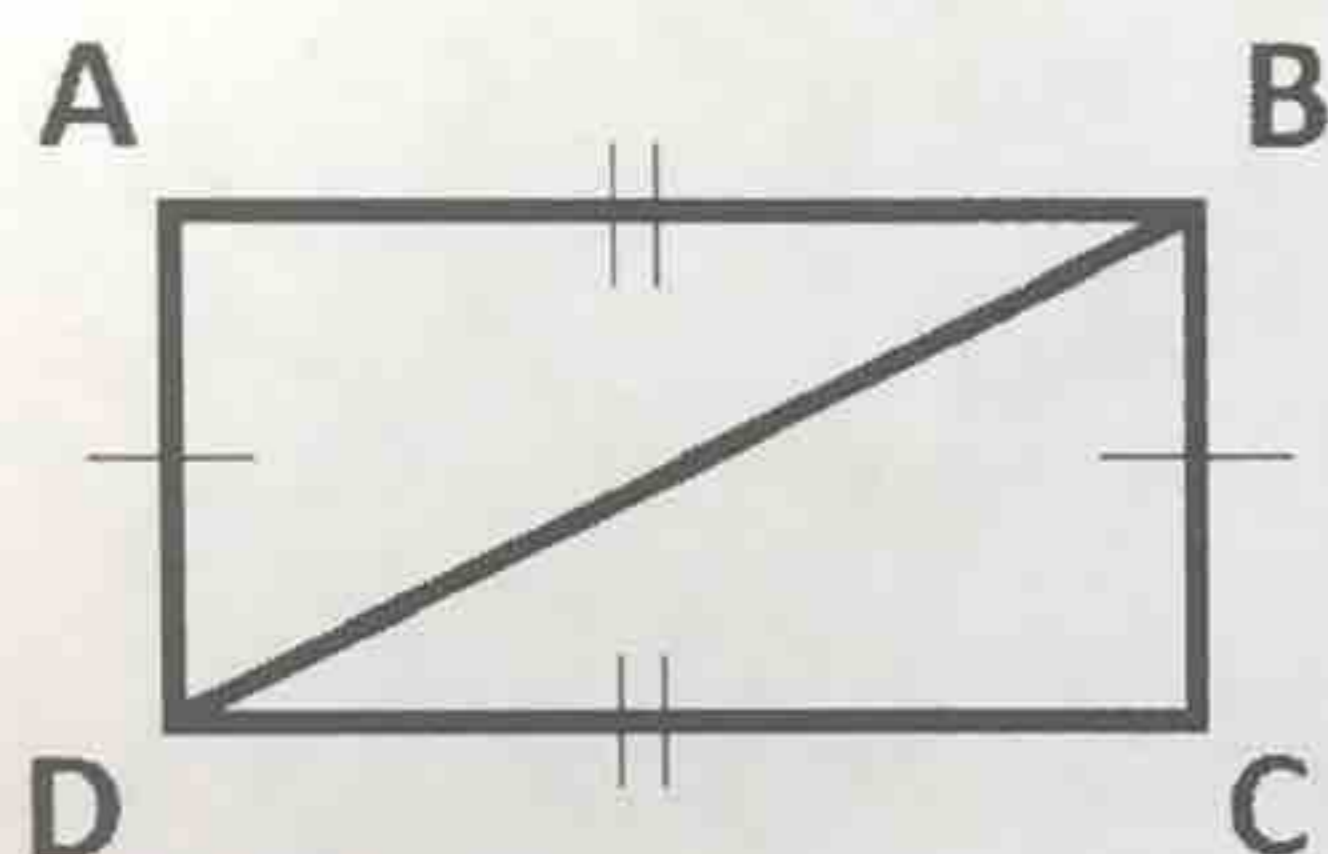
POSTULATE 19 Side-Side-Side (SSS) Congruence Postulate

If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

If Side $\overline{AB} \cong \overline{RS}$,
 Side $\overline{BC} \cong \overline{ST}$, and
 Side $\overline{CA} \cong \overline{TR}$,
 then $\triangle ABC \cong \triangle RST$.



Ex 1: Prove $\triangle ABD \cong \triangle CDB$.



STATEMENTS

1. $\overline{AB} \cong \overline{CD}, \overline{AD} \cong \overline{CB}$
2. $\overline{BD} \cong \overline{BD}$
3. $\triangle ABD \cong \triangle CDB$

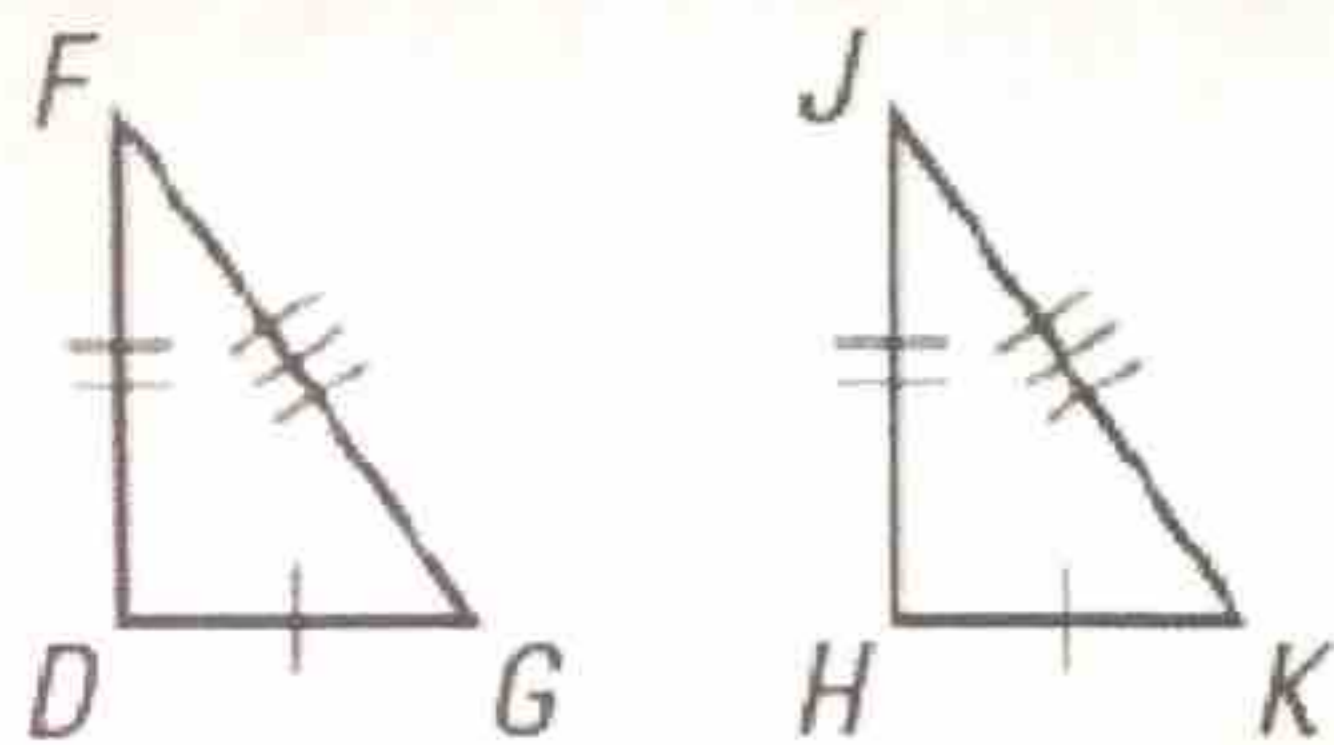
REASONS

1. Given on diagram
2. Reflexive Property of \cong Segment
3. SSS

Ex 2: Decide whether the congruence statement is true. Explain.

(a)

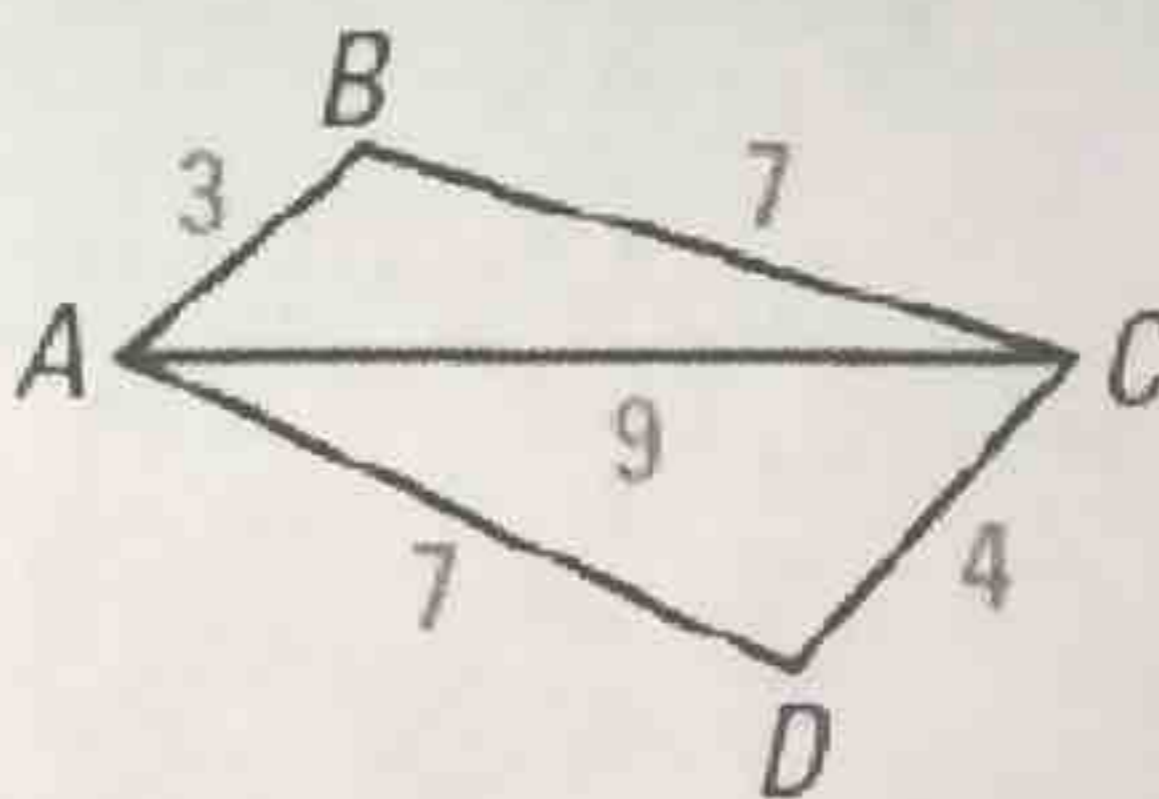
$$\triangle DFG \cong \triangle HJK$$



yes, SSS

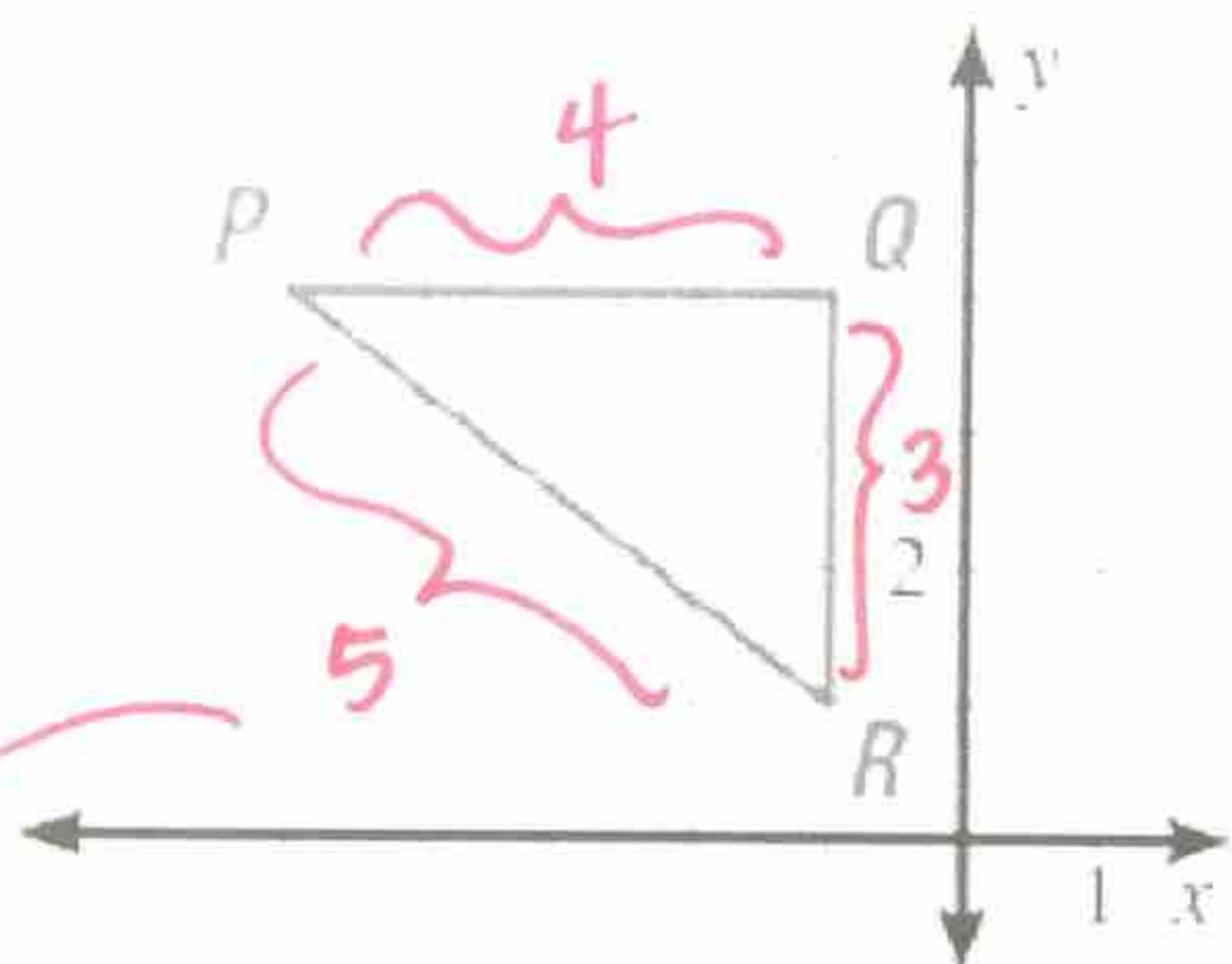
(b)

$$\triangle ACB \cong \triangle CAD$$



no,
 corresponding sides
 \overline{AB} and \overline{CD} are
 not congruent.

Ex 3: Which are the coordinates of the vertices of a triangle congruent to $\triangle XYZ$?



(A) $(-2, 4), (-7, 4), (-4, 6)$

(B) $(-1, 1), (-1, 5), (-4, 5)$

$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$25 = c^2$$

$$5 = c$$

$$d_{LM} = 4$$

$$d_{MN} = 3$$

$$d_{LN} = 5$$

congruent by SSS

Ex 4: Explain why the bench with the diagonal support is stable, while the one without the support can collapse.



The bench with the diagonal support forms triangles with fixed side lengths. By the SSS Congruence Postulate, these triangles cannot change shape, so the bench is stable. The bench without a diagonal support is not stable because there are many possible quadrilaterals with the given side lengths.