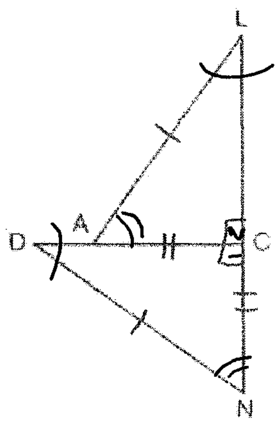
TRIANGLE CONGRUENCE PROOF

227 In the diagram of $\triangle LAC$ and $\triangle DNC$ below, $\overline{LA} \cong \overline{DN}$, $\overline{CA} \cong \overline{CN}$, and $\overline{DAC} \perp \overline{LCN}$.



Plan: Hyp-leg

① ∡1 and ∡2 are rt. ∡'s ✓

② △LAC and △DNC are rt. △'s ✓

③ $\overline{LA} \cong \overline{DN}$ ✓

④ $\overline{AC} \cong \overline{CN}$ ✓

a) Prove that $\triangle LAC \cong \triangle DNC$.

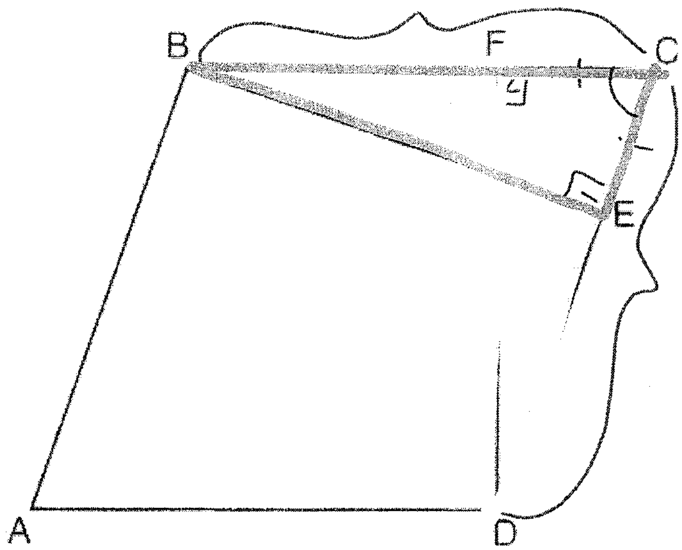
b) Describe a sequence of rigid motions that will map $\triangle LAC$ onto $\triangle DNC$.

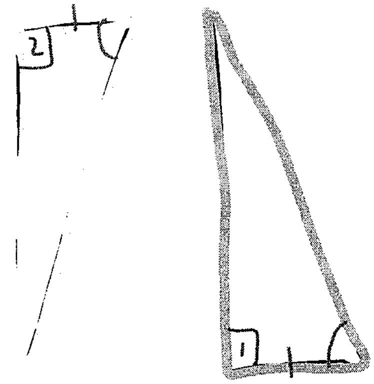
90° CCW rotation about point C.

Statement	Reason
① $LA \cong DN$ ✓ $CA \cong CN$ ✓ $DAC \perp LCN$	① Given
② ∡1 and ∡2 are rt ∡'s ✓	② ⊥ lines form rt. ∡'s
③ △LAC and △DNC are rt. △'s ✓	③ Right △'s have 1 right ∡
④ △LAC ≅ △DNC	④ Hyp-leg ≅ Hyp-leg

QUADRILATERAL PROOF

233 In the diagram of parallelogram $ABCD$ below, $\overline{BE} \perp \overline{CED}$, $\overline{DF} \perp \overline{BFC}$, $\overline{CE} \cong \overline{CF}$.





Plan: ASA
① ∢1 ≅ ∢2 ✓
② CF ≅ CE ✓
③ ∢C ≅ ∢C ✓

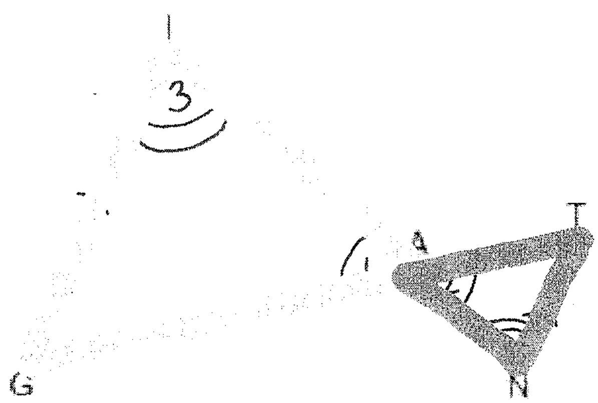
Prove $ABCD$ is a rhombus.

A rhombus is a ▱ w/ 4 ≅ sides
Plan: Prove 2 consecutive sides are ≅

Statement	Reason
① $\overline{BE} \perp \overline{CED}$, $\overline{DF} \perp \overline{BFC}$, $\overline{CE} \cong \overline{CF}$ ✓	① Given
② ∢1 and ∢2 are rt. ∢'s	② ⊥ lines form rt. ∢'s
③ ∢1 ≅ ∢2 ✓	③ all rt. ∢'s are ≅
④ ∢C ≅ ∢C ✓	④ Reflexive Property
⑤ △BCE ≅ △DCF	⑤ ASA ≅ ASA
⑥ $\overline{BC} \cong \overline{CD}$	⑥ CPCTC
⑦ ABCD is a rhombus	⑦ A rhombus ia a ▱ w/ 2 consecutive sides ≅

TRIANGLE SIMILARITY PROOF

241 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.

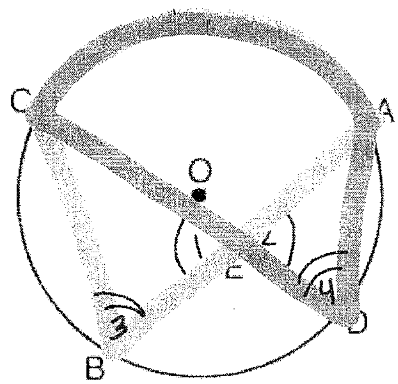


Prove: ~~$\triangle GIA \sim \triangle TNA$~~ $\frac{GI}{[illegible]} = \frac{IA}{[illegible]}$

Statement	Reason
① $\overline{GI} \parallel \overline{NT}$, $\overline{IN}$ intersects $\overline{GT}$	① Given
② $\angle 3 \cong \angle 4$	② Alt. int $\angle$'s are $\cong$
③ $\angle 1 \cong \angle 2$	③ vertical $\angle$'s are $\cong$
④ $\triangle GIA \sim \triangle TNA$	④ AA $\cong$ AA
⑤ $\frac{GI}{TN} = \frac{IA}{AN}$	⑤ corresp. sides of $\sim$ $\triangle$'s are proportional.

CIRCLE PROOF

239 Given: Circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E



PLAN

① $\triangle AED \sim \triangle BEC$ ✓

② $\frac{AE}{CE} = \frac{DE}{EB}$ ✓

③ $AE \cdot EB = CE \cdot DE$

Theorem: If two chords intersect in a circle, the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord. Prove this theorem by proving $AE \cdot EB = CE \cdot ED$. → the product of means = the product of the extremes

Statement	Reason
① Circle O, AB and CD intersect at E	① Given
② $\angle 1 \cong \angle 2$ ✓	② vertical $\angle$'s are $\cong$
③ $\angle 3 = \frac{1}{2}\overset{\frown}{CA}$, $\angle 4 = \frac{1}{2}\overset{\frown}{CA}$	③ inscribed $\angle$'s = $\frac{1}{2}$ intercepted arc
④ $\angle 3 \cong \angle 4$ ✓	④ $\angle$'s that intercept the same arc are $\cong$
⑤ $\triangle AED \sim \triangle BEC$ ✓	⑤ $AA \cong AA$
⑥ $\frac{AE}{CE} = \frac{DE}{EB}$ ✓	⑥ corresponding sides of $\sim$ $\triangle$'s are proportional
⑦ $\overline{AE} \cdot \overline{EB} = \overline{CE} \cdot \overline{DE}$	⑦ The product of the means = the product of the extremes