

Geometry CC – Mr. Valentino
 Unit 6 Lesson 2: Proving Similarity with AA

Name: _____
 Date: _____ Period: _____

Aim: How can we prove triangles are similar?

Do Now:

a] Two triangles are similar, and the ratio of each pair of corresponding sides is 2 : 1. Which statement regarding the two triangles is *not* true?

- (1) Their areas have a ratio of 4 : 1. ✓
- (2) Their altitudes have a ratio of 2 : 1. ✓
- (3) Their perimeters have a ratio of 2 : 1. ✓
- (4) Their corresponding angles have a ratio of 2 : 1.

sides 2:1
 area 4:1

b] Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?

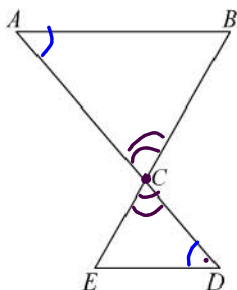
- (1) $\frac{BC}{EF} = \frac{3}{2}$ ✓
- (2) $\frac{m\angle A}{m\angle D} = \frac{3}{2}$
- (3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$ ✓ $\frac{3^2}{2^2} = \frac{9}{4}$
- (4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$ ✓

How can we prove triangles are similar?

If two angles of one triangle are congruent to the corresponding angles of another triangle, the triangles are similar.

1) Given: $\angle BAC \cong \angle EDC$

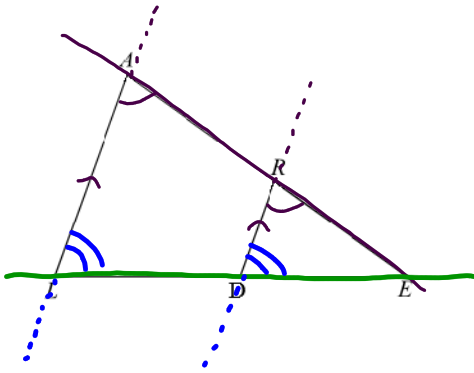
Prove: $\triangle ABC \sim \triangle DEC$



statement	reason
① $\angle BAC \cong \angle EDC$	① Given
② $\angle ACB \cong \angle DCE$	② Vertical Angles are \cong
③ $\triangle ABC \sim \triangle DEC$	③ AA \cong AA (AA Similarity)

2) Given: $\overline{LA} \parallel \overline{DR}$

Prove: $\triangle LEA \sim \triangle DER$

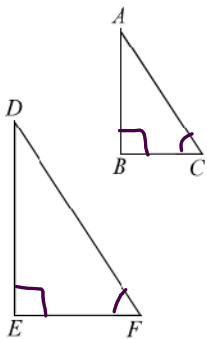


Statement	Reason
① $\overline{LA} \parallel \overline{DR}$	① Given
② $\angle A \cong \angle R$	② Parallel lines cut by a transversal form congruent corresponding \angle 's (Corresponding \angle Theorem)
③ $\angle E \cong \angle E$	③ Reflexive Property
④ $\triangle LEA \sim \triangle DER$	④ AA \cong AA

3) Given: $\angle BCA \cong \angle EFD$,

$\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$

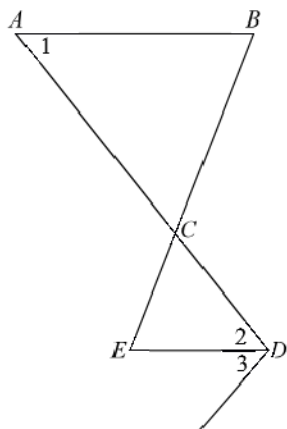
★ Prove: $\frac{DE}{AB} = \frac{EF}{BC}$



Statement	Reason
① $\angle BCA \cong \angle EFD$	① Given
② $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$	② Given
③ $\angle B$ and $\angle E$ are right \angle 's	③ \perp lines form right \angle 's
④ $\angle B \cong \angle E$	④ All right \angle 's are \cong
⑤ $\triangle ABC \sim \triangle DEF$	⑤ AA \cong AA
⑥ $\frac{DE}{AB} = \frac{EF}{BC}$	★ ⑥ Corresponding sides of similar triangles are proportional

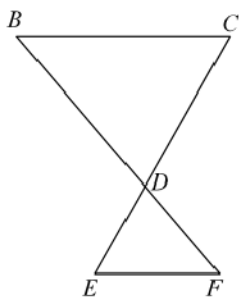
4) Given: $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 3$

Prove: $\frac{AC}{CD} = \frac{AB}{ED}$



5) Given: $\angle CBD \cong \angle FED$

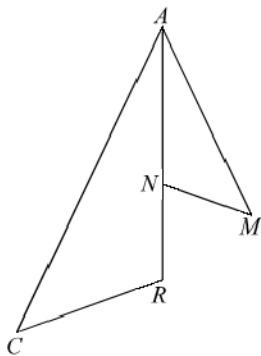
Prove: $\triangle BCD \sim \triangle FED$



6) Given: $\angle ACR \cong \angle AMN$,
 \overline{RA} bisects $\angle CAM$.

6 and # 7 for HW

Prove: $\triangle CAR \sim \triangle MAN$



7) Given: $\overline{DE} \parallel \overline{CB}$

Prove: $\triangle CAB \sim \triangle DAE$

