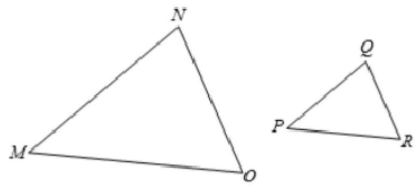
Geometry CC – Mr. Valentino
Unit 6 Lesson 3: Similarity with SSS & SAS

Name: ______________________
Date: ______________ Period: ______

Aim: How can we prove triangles are similar with some **new** strategies?

Do Now:

Recall! In the diagram, $\Delta MNO \sim \Delta PQR$ similar



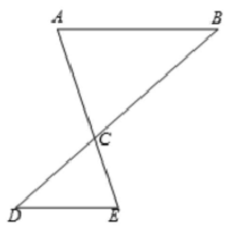
Corresponding ANGLES of similar triangles are congruent.

Corresponding SIDES of similar triangles are proportional.

What is the difference between these proofs?

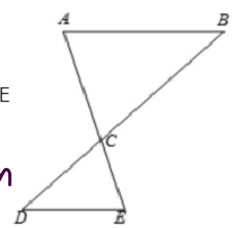
Given: $\overline{AB} // \overline{DE}$

Prove: $\frac{AC}{CE} = \frac{CB}{CD}$



Given: $\overline{AB} // \overline{DE}$

Prove: AC x CD = CB x CE

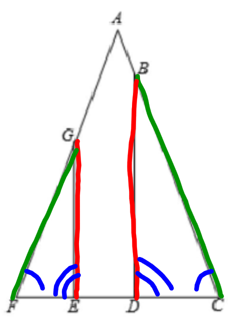


☆ the cross multiplication of the similarity proportion ☆

1. Given: ΔFAC is isosceles with vertex A,

$\angle GEF \cong \angle BDC$

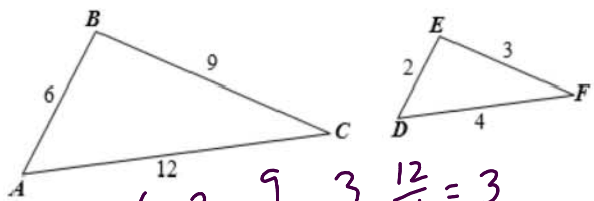
Prove: $GE \times BC = FG \times BD$



statement	reason
① ΔFAC is isosceles with vertex A	① Given
② $\measuredangle F \cong \measuredangle C$	② The base angles of an isosceles Δ are $\cong$
③ $\measuredangle GEF \cong \measuredangle BDC$	③ Given
④ $\Delta GEF \sim \Delta BDC$	④ AA $\cong$ AA
⑤ $\frac{GE}{BD} = \frac{GF}{BC}$	⑤ Corresponding sides of similar Δ's are proportional
NEW! ⑥ $GE \times BC = FG \times BD$	⑥ In a proportion, the product of the means equals the product of the extremes.

BEWARE The next two methods for proving similar triangles are NOT the same theorems used to prove congruent triangles.

Hooray! We can prove triangles are similar two other ways!

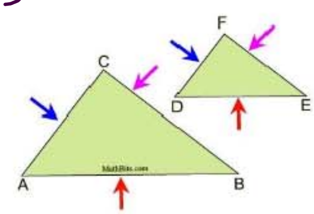


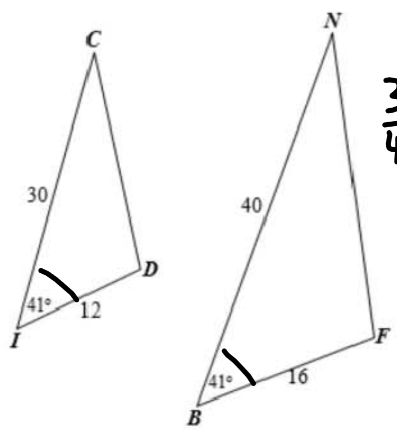
SSS Similarity - If the three sets of corresponding sides of two triangles are in proportion, the triangles are similar.

$\frac{6}{2} = 3 \quad \frac{9}{3} = 3 \quad \frac{12}{4} = 3$

If: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

Then: $\Delta ABC \sim \Delta DEF$





$\frac{30}{40} = \frac{3}{4}$

$\frac{12}{16} = \frac{3}{4}$

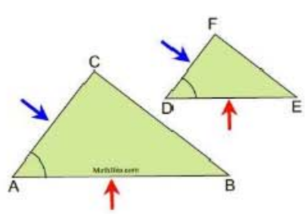
SAS Similarity -

If an angle of one triangle is congruent to the corresponding angle of another triangle and the lengths of the sides including these angles are in proportion, the triangles are similar.

If: $\frac{AB}{DE} = \frac{AC}{DF}$

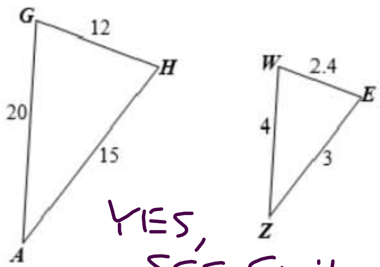
and $\angle A \cong \angle D$

Then: $\Delta ABC \sim \Delta DEF$

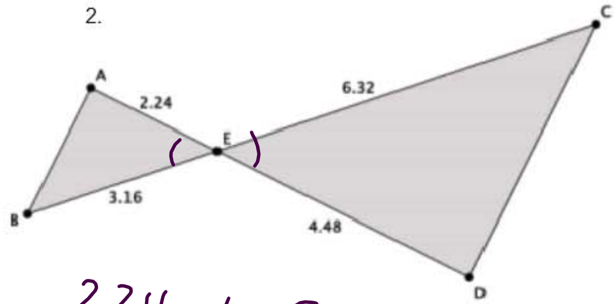


Determine if the triangles are similar. Explain why or why not:

1.



2.



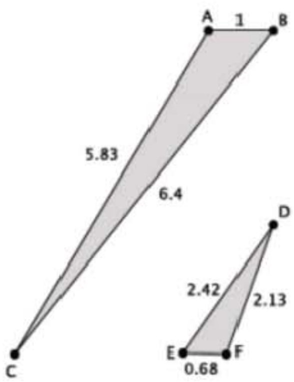
YES,
SSS Similarity.

$\frac{20}{4}=5$ $\frac{12}{2.4}=5$ $\frac{15}{3}=5$

$\frac{2.24}{4.48}=\frac{1}{2}$ $\frac{3.16}{6.32}=\frac{1}{2}$

YES, SAS Similarity.

3.



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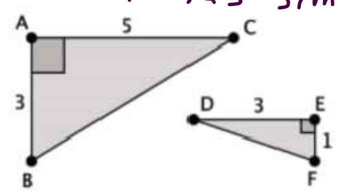
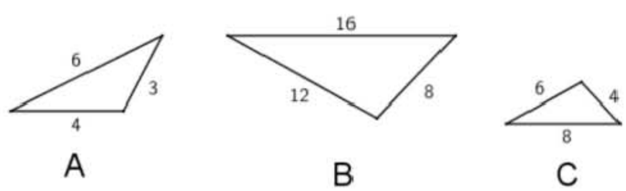


5. Determine which triangles, if any, are similar: Explain why or why not.



6. Determine which triangles, if any, are similar. Explain why or why not.