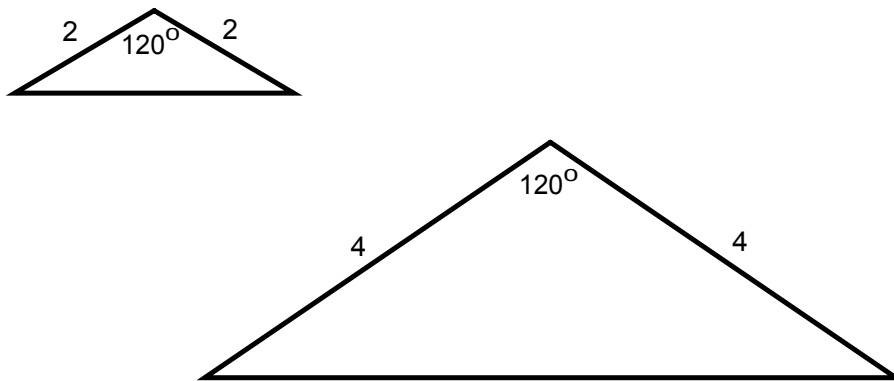


Similar Triangles

Goal:

- to be able to identify similar triangles
- to understand the minimum conditions necessary to show that two triangles are similar

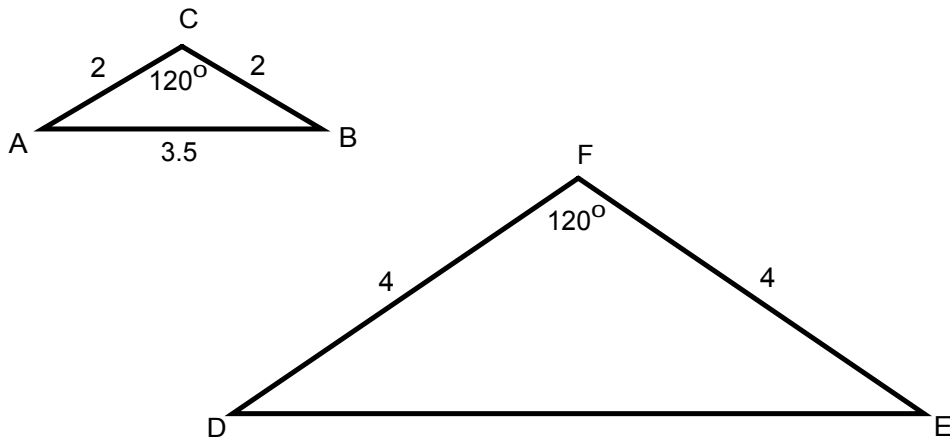
The following two triangles are similar:



What does it mean when two figures are similar?

- same shape
 - ↳ all angles are congruent
- different size
 - ↳ corresponding sides are proportional

What is the measure of DE?



corresponding sides $\frac{4}{2} = 2$ similarity ratio

$$m\overline{DE} = 2 \cdot (3.5) = 7 \text{ units}$$

which means all the sides on big triangle are double the length of corresponding sides on small triangle.

using proportion:

$$\frac{4}{2} = \frac{m\overline{DE}}{3.5}$$

$$4(3.5) = 2 \cdot m\overline{DE}$$

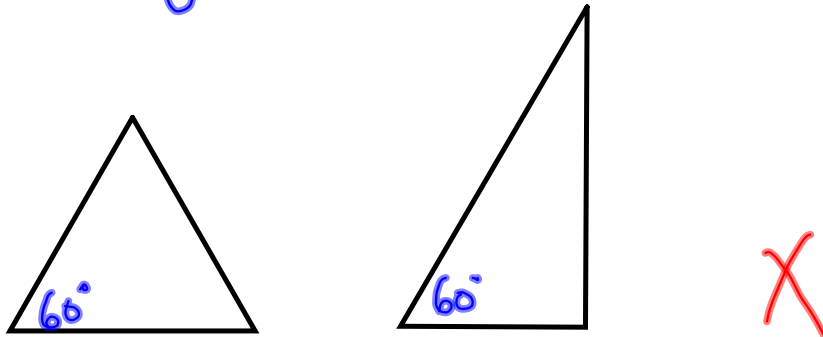
$$14 = 2 \cdot m\overline{DE}$$

$$\frac{14}{2} = m\overline{DE}$$

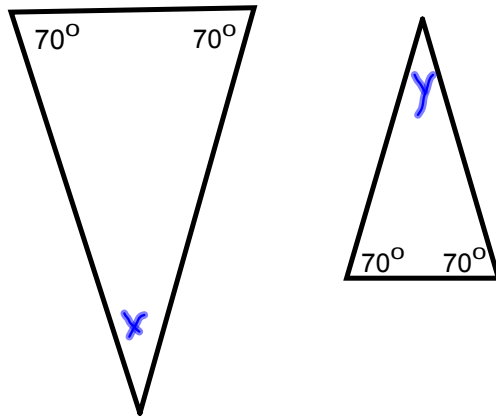
$$7 \text{ units} = m\overline{DE}$$

What minimum information is needed to show that two triangles are similar?

- One angle



- Two angles



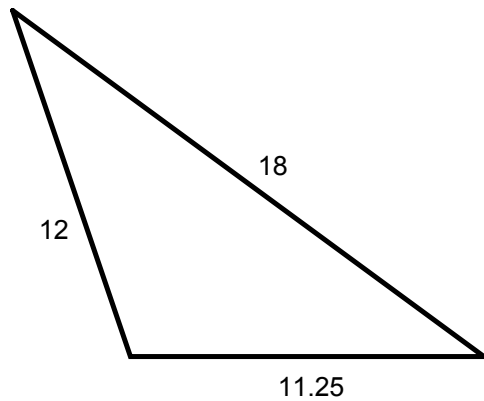
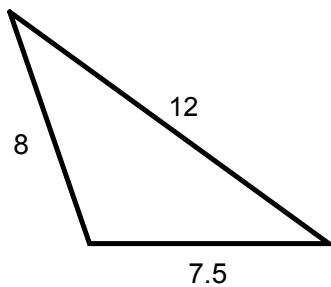
$$x = 180 - (70 + 70) \\ = 40$$

$$y = 180 - (70 + 70) \\ = 40$$

When two pairs of corresponding angles are congruent, the two triangles must be similar.

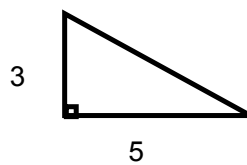
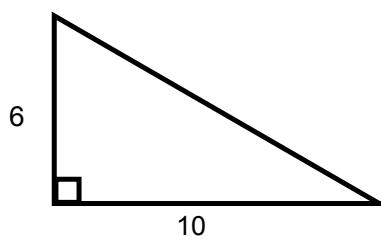
AA

$$\frac{18}{12} = \frac{12}{8} = \frac{11.25}{7.5} = 1.5$$



If all three ^{corresponding} sides are proportional
the two triangles must be similar.

SSS



If two pairs of corresponding sides are proportional and contain congruent angles, then the two triangles are similar. SAS

Rules for Congruency

SSS

SAS

ASA

Rules for Similar

SSS

SAS

AA

Homework: p.172 #1,2

Quiz

Hypothesis: 1) $\overline{AB} \cong \overline{CD}$

2) $\overline{AB} \parallel \overline{CD}$

Conclusion: 3) $\overline{AE} \cong \overline{ED}$

4) Given by hypothesis

5) Alternate-interior angles are congruent when formed by a transversal and parallel lines

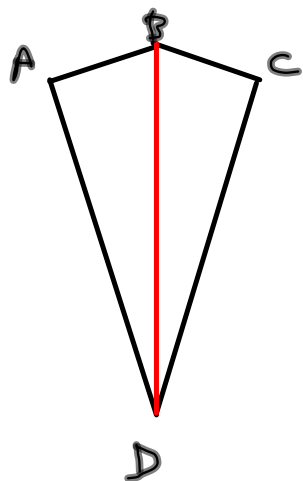
6) $\angle A \cong \angle D$

7) By ASA

8) In congruent triangles, corresponding sides are congruent

p.166

#17.



Hypothesis: - $\overline{AD} \cong \overline{CD}$

- BD is angle bisector of $\angle ADC$

Conclusion: $\overline{AB} \cong \overline{BC}$

STATEMENT

$\overline{AD} \cong \overline{CD}$

$\angle ADB \cong \angle CDB$

$\overline{BD} \cong \overline{BD}$

$\triangle ADB \cong \triangle CDB$

$\overline{AB} \cong \overline{BC}$

JUSTIFICATION

Given

BD is angle bisector

Common side

By SAS

Corresponding sides
in congruent triangles are
congruent