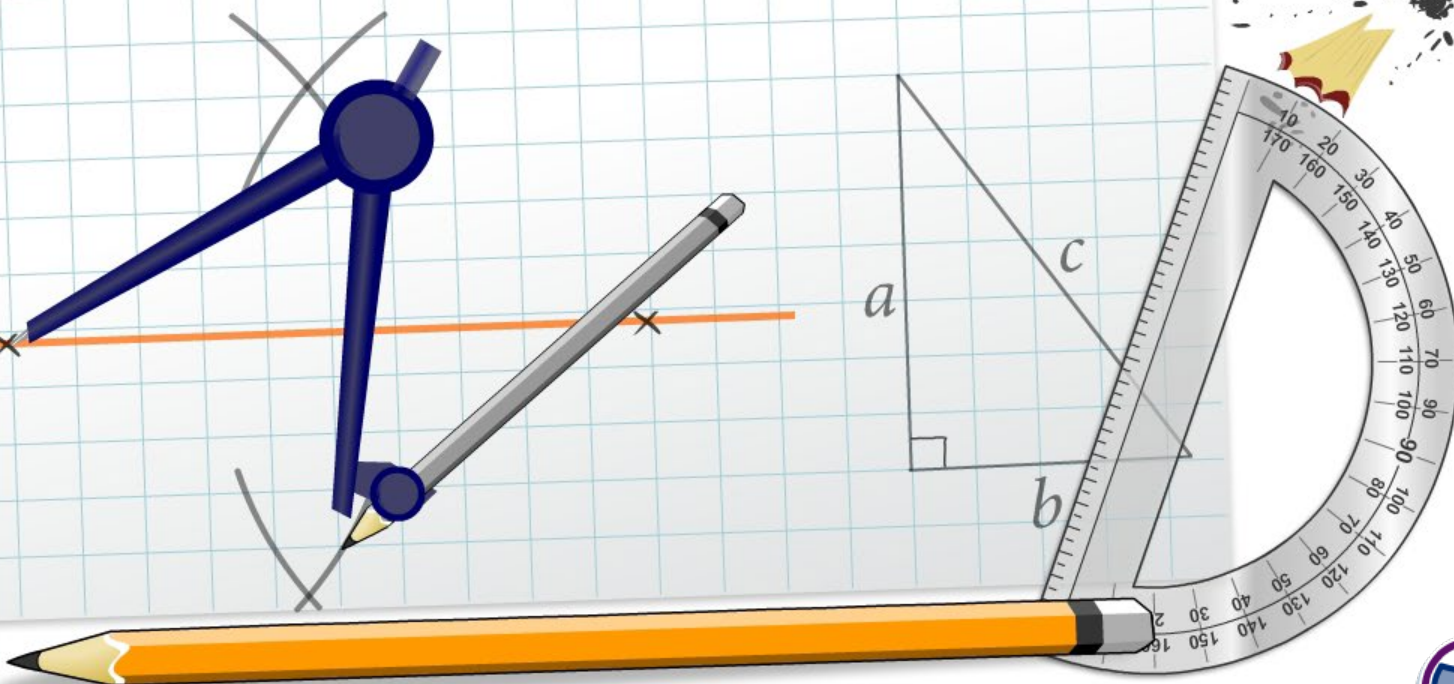# Similar Triangles

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

MODELING

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) **Make sense of problems and persevere in solving them.**

2) **Reason abstractly and quantitatively.**

3) **Construct viable arguments and critique the reasoning of others.**

4) **Model with mathematics.**

5) **Use appropriate tools strategically.**

6) **Attend to precision.**

7) **Look for and make use of structure.**

8) **Look for and express regularity in repeated reasoning.**

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Triangles are similar when **corresponding angles** are congruent and **corresponding sides** have the same ratio.

Prove that $\triangle ABC \sim \triangle DEC$.

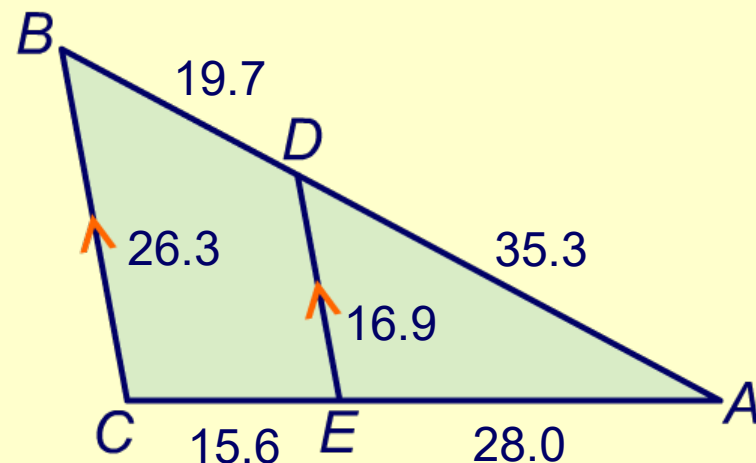show corresponding angles are congruent:

reflexive property of congruence:

$\angle BAC \cong \angle DAE$ ✓

corresponding angles postulate:

$\angle ADE \cong \angle ABC$ ✓

$\angle AED \cong \angle ACB$ ✓

show corresponding sides have the same ratio:

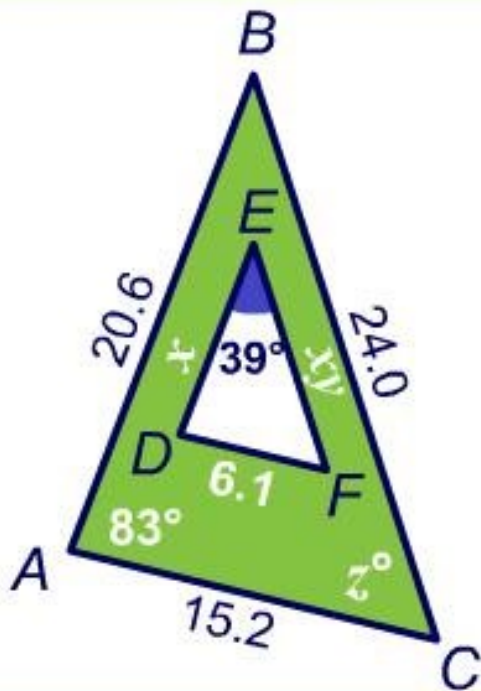$AD/AB = 35.3/(35.3+19.7) = 0.64$ ✓

$DE/BC = 16.9/26.3 = 0.64$ ✓

$AE/AC = 28.0/(28.0+15.6) = 0.64$ ✓

Using similarity in triangles

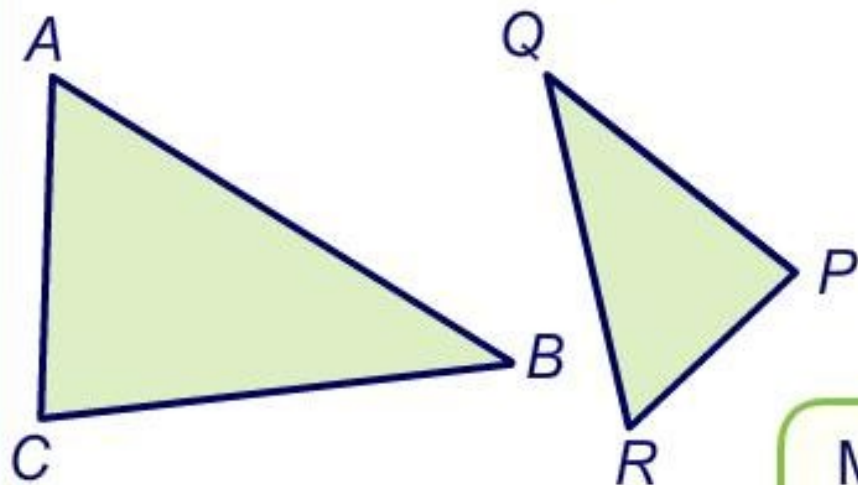**Question: 1/4** $\triangle ABC$ and $\triangle DEF$ are similar.

Describe how to determine the missing quantities x, y and z?

Press the "=" button to show the calculations step by step.

Triangle similarity postulates
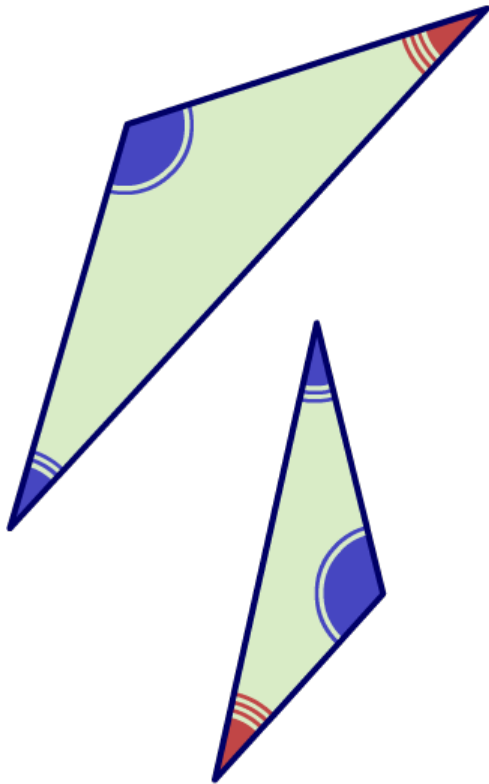

AA similarity

SSS similarity

SAS similarity

Much like the SSS, SAS, ASA and AAS congruence postulates are used to prove triangles congruent, the AA, SSS and SAS similarity postulates are used to prove triangles similar.

Establishing the AA similarity postulate

*Angle-angle similarity postulate:*
If two angles of a triangles are congruent to two angles of another triangle, then the two triangles are similar.

- If two triangles are similar, they are related by similarity transformations.

- Rotation, reflection and transformation preserve angles and side lengths.

- Dilation preserves angle but changes the sides lengths proportionally.

- If two angles of a triangle are specified, the third one is also determined.

- Therefore, two triangles with two congruent angles are similar.

Similar triangles

A — 10 cm — B

9 cm   7.2 cm

C

7.2 cm   9 cm

D — 10 cm — E
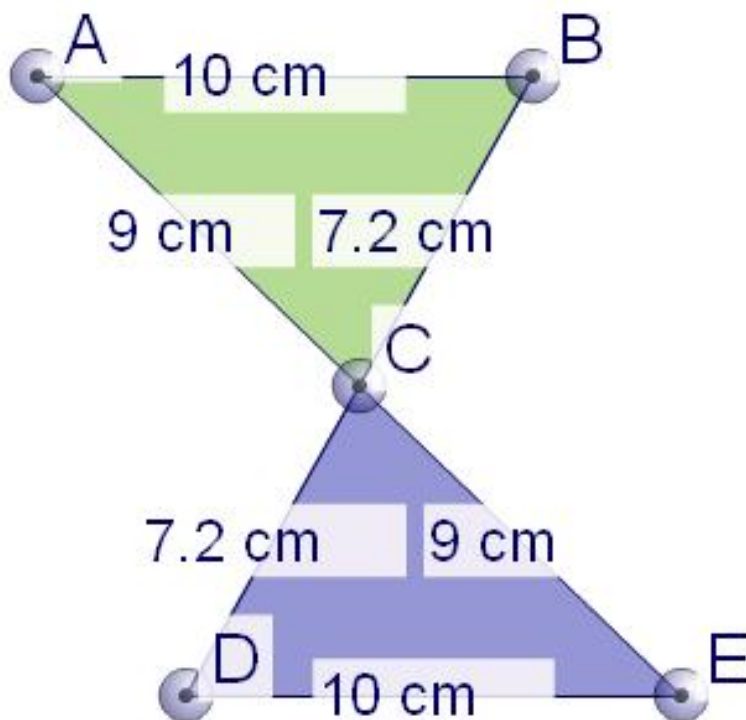
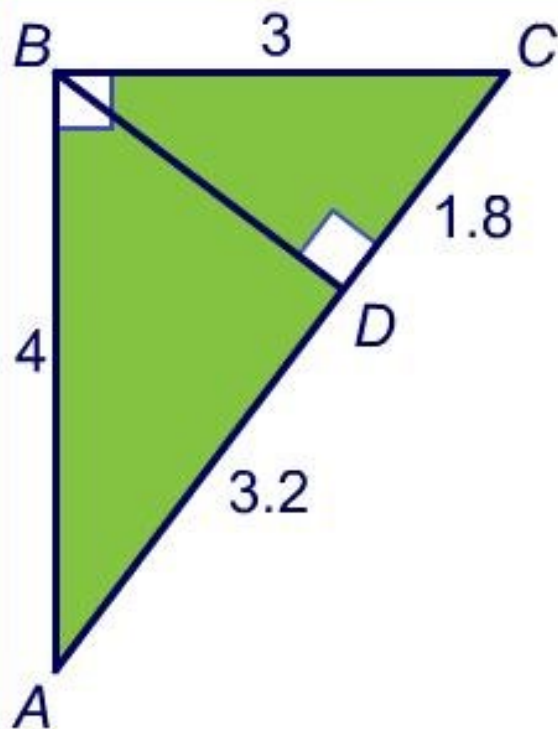$$\frac{DE}{AB} = \frac{DC}{BC} = \frac{CE}{AC} = \boxed{}$$

The camera on the satellite takes a photo of something on Earth. By using similar triangles, can you find the length of the object?

The height above ground is 150 km, the image size is 25 mm, and the focal length is 100 mm.

image size

focal length of camera

lens

height above Earth

object size

Summary activity
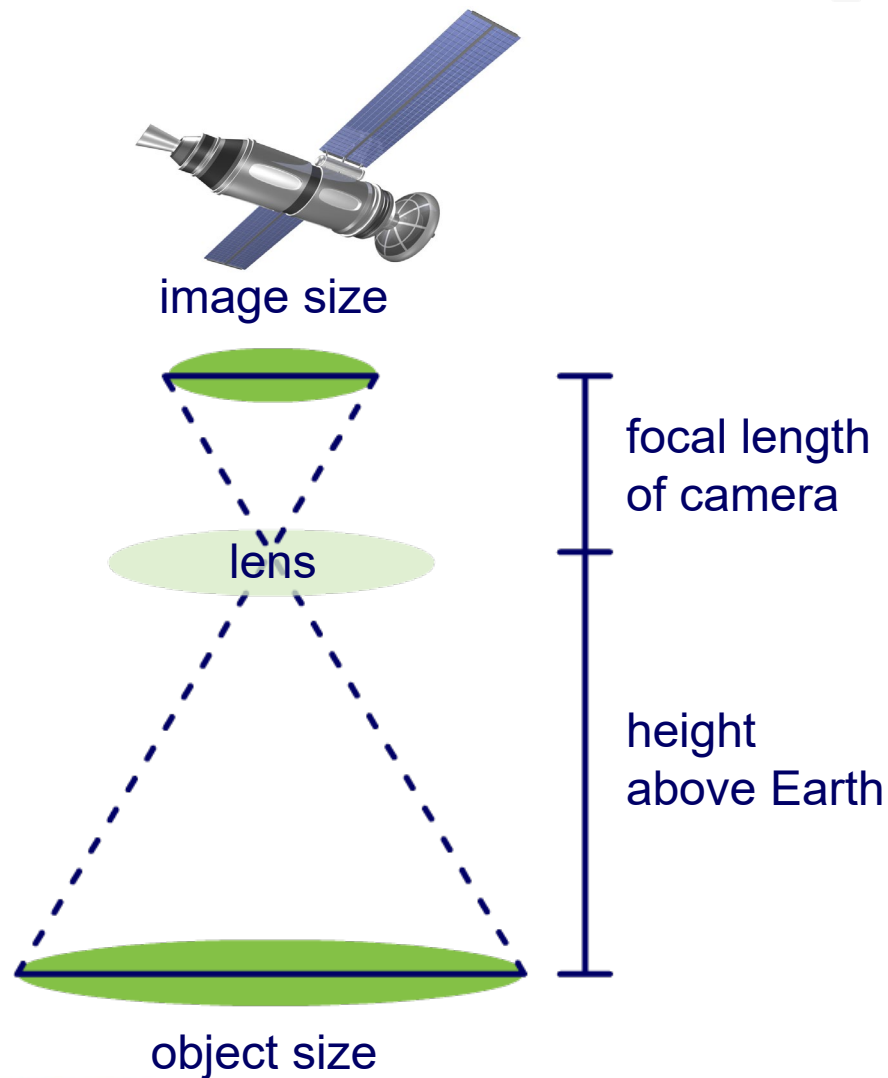
Similar triangles summary quiz

Question: 1/3 Show that $\triangle ABC$ and $\triangle BCD$ are similar.

B ——3—— C

1.8

D

4

3.2

A

Press the "=" button to show the calculations step-by-step.

© Boardworks 2012

Surveyors can use similar triangles to accurately measure distances that cannot be directly accessed.

start

Press **start** to begin.