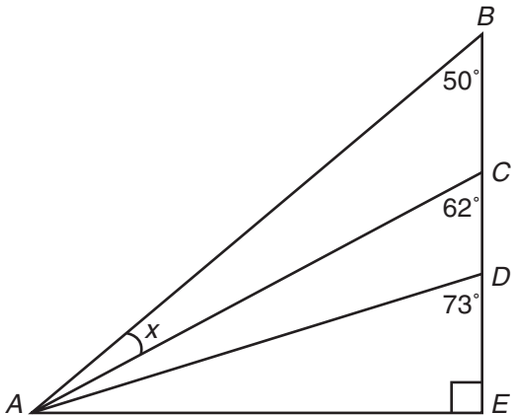
Unit 4: Geometry Lesson 4.2

Game On!

(3) 1. Determine the measure of angle x in the diagram. Be sure to explain your reasoning.



(2) 2. Prove that an exterior angle of a triangle is equal to the sum of the non-adjacent interior angles of that triangle. Use the following variables in your proof.

Angle	**Variable**
Exterior angle	w
Interior adjacent angle	x
Interior non-adjacent angle 1	y
Interior non-adjacent angle 2	z

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3. In Alberta, ramps that are designed for people using mobility devices must meet certain safety requirements. One such requirement is that the angle between the ramp and the horizontal must be less than 4.8°. Explain whether or not the ramp in the picture below is acceptable. Labelling the diagram may help your explanation. You may also need to extend lines or draw additional lines to help solve this problem.

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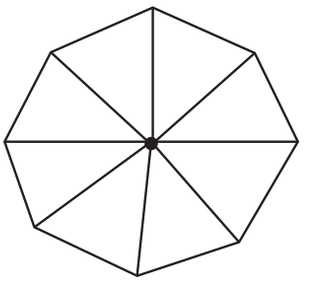
(2) 4. Determine the number of sides in a regular polygon if each interior angle measures 160°.

(6) 5. Olek has come up with a proof showing that an octagon has an interior angles sum of 1440°.



- Using a straightedge, draw a convex octagon.
- Draw a point inside the octagon.
- Connect the point to each vertex on the octagon.
- There are 8 triangles in the diagram, so the sum of the interior angles in all of the triangles is $8 \times 180° = 1440°$.
- The interior angles sum for an octagon is 1440°.

a. Compare Olek's conclusion with the result obtained from applying the interior angles sum formula.

b. Explain the error in Olek's proof.

c. Correct Olek's proof.

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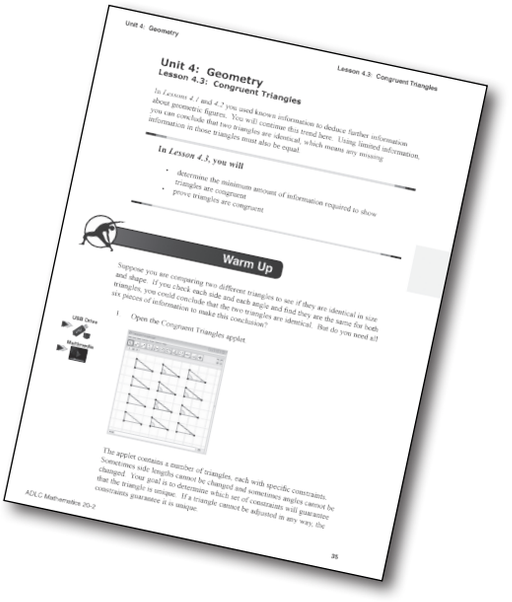
You have completed *Lesson 4.2* Assignment *Game On!*. Please return to the *Module* and continue your training with *Lesson 4.3*.


Unit 4: Geometry

Lesson 4.3: Congruent Triangles

Unit 4: Geometry
Lesson 4.3: Congruent Triangles

In *Lessons 4.1* and *4.2* you used known information to deduce further information about geometric figures. You will continue this trend here. Using limited information, you can conclude that two triangles are identical, which means any missing information in those triangles must also be equal.

In Lesson 4.3, you will

- determine the minimum amount of information required to show triangles are congruent
- prove triangles are congruent

Warm Up

Suppose you are comparing two different triangles to see if they are identical in size and shape. If you check each side and each angle and find they are the same for both triangles, you could conclude that the two triangles are identical. But do you need all six pieces of information to make this conclusion?

1. Open the Congruent Triangles applet.

USB Drive

The applet contains a number of triangles, each with specific constraints. Sometimes side lengths cannot be changed and sometimes angles cannot be changed. Your goal is to determine which set of constraints will guarantee that the triangle is unique. If a triangle cannot be adjusted in any way, the constraints guarantee it is unique.

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