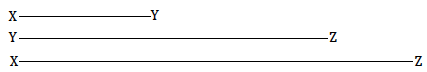
Lesson 9: Conditions for a Unique Triangle―Three Sides and Two Sides and the Included Angle

Classwork

Exploratory Challenge

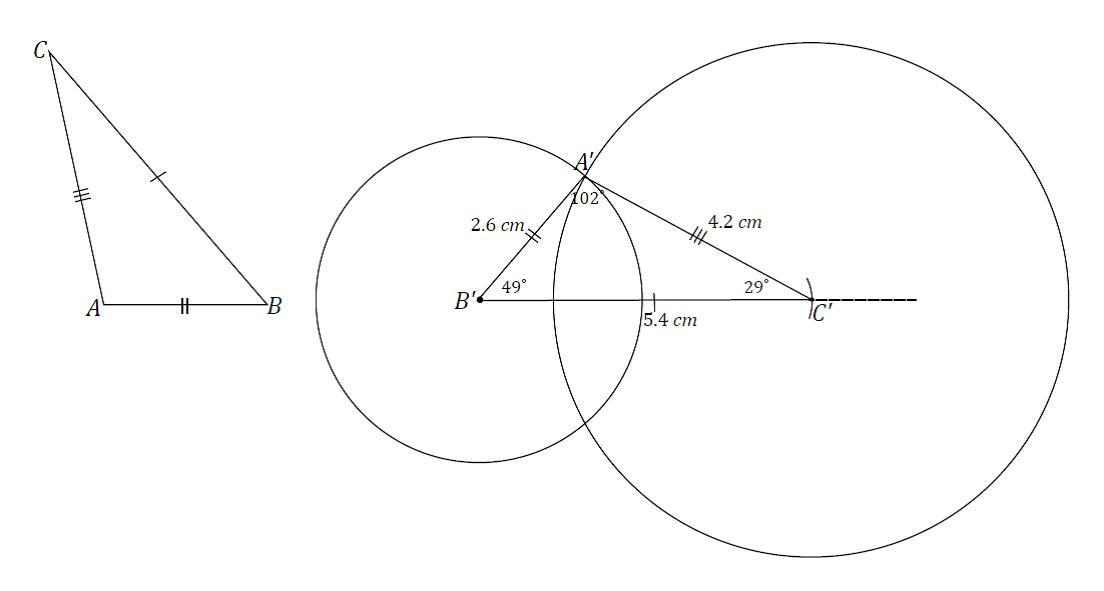
1. A triangle exists with side lengths of the segments below. Draw a triangle with the same side lengths as . Use your compass to determine the sides of . Use your ruler to measure side lengths. Leave all construction marks as evidence of your work, and label all side and angle measurements.

Under what condition is drawn? Compare the triangle you drew to two of your peers’ triangles. Are the triangles identical? Did the condition determine a unique triangle? Use your construction to explain why. Do the results differ from your predictions?

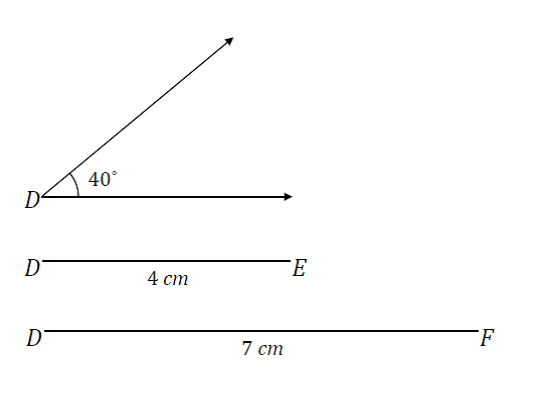


1. is located below. Copy the sides of the triangle to create . Use your compass to determine the sides of . Use your ruler to measure side lengths. Leave all construction marks as evidence of your work, and label all side and angle measurements.

Under what condition is drawn? Compare the triangle you drew to two of your peers’ triangles. Are the triangles identical? Did the condition determine a unique triangle? Use your construction to explain why.



1. A triangle has an angle of adjacent to side lengths of cm and cm. Construct with side lengths cm, cm, and included angle . Use your compass to draw the sides of . Use your ruler to measure side lengths. Leave all construction marks as evidence of your work, and label all side and angle measurements.

Under what condition is drawn? Compare the triangle you drew to two of your peers’ triangles. Did the condition determine a unique triangle? Use your construction to explain why.

1. has side lengths cm, cm, and . Draw under the same conditions. Use your compass and protractor to draw the sides of . Use your ruler to measure side lengths. Leave all construction marks as evidence of your work, and label all side and angle measurements.

Under what condition is drawn? Compare the triangle you drew to two of your peers’ triangles. Are the triangles identical? Did the condition determine a unique triangle? Use your construction to explain why.

Problem Set

1. A triangle with side lengths cm, cm, and cm exists. Use your compass and ruler to draw a triangle with the same side lengths. Leave all construction marks as evidence of your work, and label all side and angle measurements.

Under what condition is the triangle drawn? Compare the triangle you drew to two of your peers’ triangles. Are the triangles identical? Did the condition determine a unique triangle? Use your construction to explain why.

1. Draw triangles under the conditions described below.
   1. A triangle has side lengths cm and cm. Draw two non-identical triangles that satisfy these conditions. Explain why your triangles are not identical.
   2. A triangle has a side length of cm opposite a angle. Draw two non-identical triangles that satisfy these conditions. Explain why your triangles are not identical.
2. Diagonal is drawn in square . Describe what condition(s) can be used to justify that is identical to What can you say about the measures of and ? Support your answers with a diagram and explanation of the correspondence(s) that exists.
3. Diagonals and are drawn in square . Show that is identical to , and then use this information to show that the diagonals are equal in length.
4. Diagonal is drawn in rhombus . Describe the condition(s) that can be used to justify that is identical to Can you conclude that the measures of and are the same? Support your answer with a diagram and explanation of the correspondence(s) that exists.
5. Diagonals and are drawn in rhombus and meet at point . Describe the condition(s) that can be used to justify that is identical to Can you conclude that the line segments and are perpendicular to each other? Support your answers with a diagram and explanation of the correspondence(s) that exists.