

Lesson 10: Conditions for a Unique Triangle—Two Angles and a Given Side

Classwork

Exploratory Challenge

1. A triangle has angles and and included side cm. Draw triangle under the same condition as . 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.

2. A triangle has angles and and included side cm. Draw triangle under the same condition. 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.

3. A triangle has angles and and side cm. Draw triangle under the same condition. 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.

4. A triangle has angles and and side cm. Draw triangle under the same condition. 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. In triangle $\triangle ABC$, $\angle A = 30^\circ$ and $\angle B = 60^\circ$. Side $AC = 10$ cm. Draw triangle $\triangle DEF$ under the same condition as $\triangle ABC$. Leave all construction marks as evidence of your work, and label all side and angle measurements. What can be concluded about $\triangle ABC$ and $\triangle DEF$? Justify your response.
2. In triangle $\triangle ABC$, $\angle A = 30^\circ$ and $\angle B = 60^\circ$. Side $AC = 10$ cm. Draw triangle $\triangle DEF$ under the same condition as $\triangle ABC$. Leave all construction marks as evidence of your work, and label all side and angle measurements. What can be concluded about $\triangle ABC$ and $\triangle DEF$? Justify your response.
3. $\angle A$, $\angle B$, and $\angle C$ are collinear, and $\angle A = 30^\circ$. What can be concluded about $\angle B$ and $\angle C$? Justify your answer.
4. Draw $\triangle ABC$ so that $\angle A$ has a measurement of 30° , $\angle B$ has a measurement of 60° , and AC has a length of 10 cm. What are the lengths of the other sides?
5. Draw $\triangle ABC$ so that $\angle A$ has a measurement of 30° , $\angle B$ has a measurement of 60° , and AC has a length of 10 cm. What is the length of the longest side?