Name _____ Class _____ Date _____

Reteaching 5-5

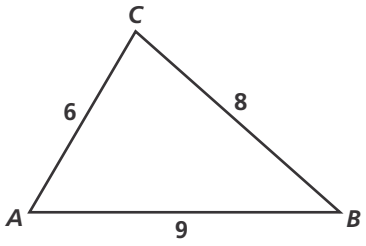
Inequalities in Triangles

OBJECTIVE: Using inequalities involving triangle side lengths and angle measures to solve problems

MATERIALS: Straightedge

Example

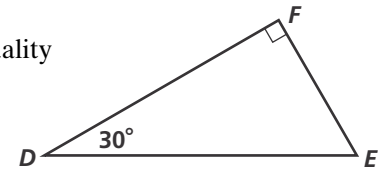
Use the triangle inequality theorems to answer the questions.



a. Which is the largest angle of $\triangle ABC$?
$\overline{AB}$ is the longest side of $\triangle ABC$.
$\angle C$ lies opposite $\overline{AB}$.
$\angle C$ is the largest angle of $\triangle ABC$.

b. Which is the shortest side of $\triangle DEF$?
Find $m\angle E$.

$m\angle D + m\angle E + m\angle F = 180$	Triangle Angle-Sum Theorem
$30 + m\angle E + 90 = 180$	Substitution
$120 + m\angle E = 180$	Addition
$m\angle E = 60$	Subtraction Property of Equality



$\angle D$ is the smallest angle of $\triangle DEF$.
Because $\overline{FE}$ lies opposite $\angle D$,
$\overline{FE}$ is the shortest side of $\triangle DEF$.

Exercises

Complete the following exercises.

1. Draw three triangles, one obtuse, one acute, and one right. Label the vertices. Exchange your triangles with a partner.

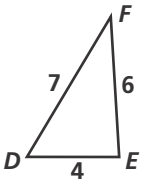
a. Identify the longest and shortest sides of each triangle.

b. Identify the largest and smallest angles of each triangle.

c. Describe the relationship between the longest and shortest sides and the largest and smallest angles for each of your partner's triangles.

Which are the largest and smallest angles of each triangle?

2.



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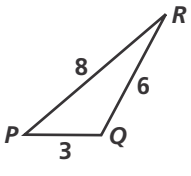

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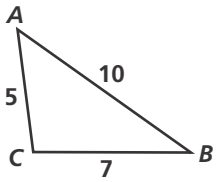
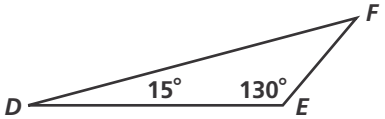


Which are the longest and shortest sides of each triangle?

5.



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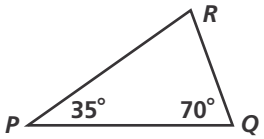

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