Geometry
Big Ideas Chapter 5 Study Guide - Congruent Triangles

Definitions
Acute Triangle: a triangle with three acute angles
Equiangular Triangle: a triangle with three congruent angles
Equilateral Triangle: a triangle with three congruent sides
Right Triangle: a triangle with one right angle
Obtuse Triangle: a triangle with one obtuse angle
Isosceles Triangle: a triangle with at least two congruent sides

Scalene Triangle: a triangle with no congruent sides
Interior Angle: formed by two sides of a triangle
Exterior Angle: angles that form linear pairs with the interior angles.
Corresponding Part: a side or angle of a figure that can be mapped one-to-one to a side or angle of a congruent figure.
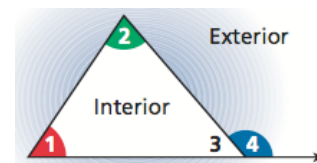
Definitions
CPCTC: Corresponding Parts of Congruent Triangles are Congruent.

Theorems and Postulates
- **Triangle Sum Theorem**: The sum of the measures of the interior angles of a triangle is 180°.
- **Exterior Angle Theorem**: The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.
- **Corollary to the Triangle Sum Theorem**: The acute angles of a right triangle are complementary.
- **Third Angles Theorem**: If two angles of one triangle are congruent to two angles of another triangle, then the third angle of both are also congruent.

Triangle Congruence Theorems
- **SAS Congruence Theorem**: If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the triangles are congruent.
- **SSS Congruence Theorem**: If three sides of one triangle are congruent to three sides of a second triangle, then the triangles are congruent.
- **HL Congruence Theorem**: If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and leg of a second triangle, then the triangles are congruent.
- **ASA Congruence Theorem**: If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the triangles are congruent.
- **AAS Congruence Theorem**: If two angles and a non-included side of one triangle are congruent to two angles and a non-included side of a second triangle, then the triangles are congruent.

Isosceles Triangle Theorems
- **Base Angles Theorem (Isosceles Triangle Theorem)**: If two sides of a triangle are congruent, then the angles opposite them are congruent. The converse is also true.
- **Corollary to the Base Angles** Theorem: If a triangle is equilateral, then it is equiangular. The converse is also true.
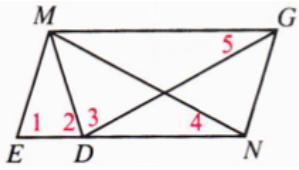
Constructions
An equilateral triangle (P. 254)
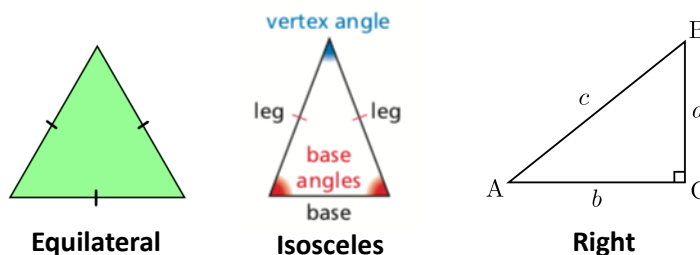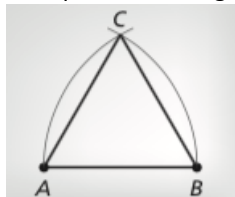
Equilateral

Isosceles

Right
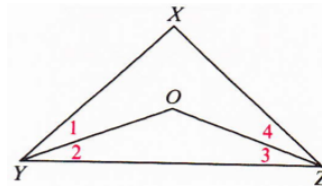
1) Given: $\angle 1 \cong \angle 2 \cong \angle 3; \overline{EN} \cong \overline{DG}$
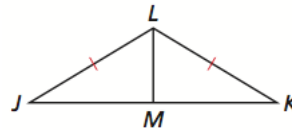
Prove: $\angle 4 \cong \angle 5$

Statements	Reasons

2) Given: $\overline{XY} \cong \overline{XZ}$, $\overline{OY} \cong \overline{OZ}$

Prove: $\angle 1 \cong \angle 4$
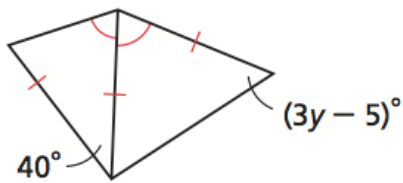

Statements	Reasons

3) Use the following set of points to prove $\angle BAC \cong \angle EDF$.
A(-1, 1), B(2, 3), C(2, -2), D(2, -3), E(-1, -5), F(-1, 0)

4) Given: $\overline{LM}$ bisects $\angle JLK$, $\overline{JL} \cong \overline{KL}$.
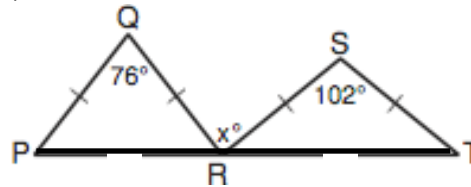
Prove: M is the midpoint of $\overline{JK}$.
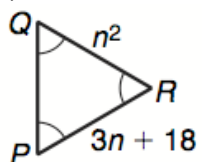

(use separate sheet of paper)

5) Find the value of y.

$(3y-5)°$

$40°$

6) Find the value of x.

7) Find PQ.

n^2

R

$3n + 18$

8) A triangular shaped trellis has angles R, S, and T that measure 73°, 73°, and 34° respectively. If ST = 4y + 6 and TR = 7y - 21, what is the value of y?