Key Concepts-- Chapters 1 and 2

Three *noncollinear* points determine exactly one plane.
The intersection of two planes is a line.

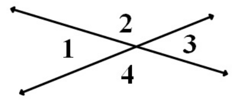
conditional statement If $n = 2$, then $2n = 4$.

hypothesis $n = 2$ *conclusion* $2n = 4$

converse If $2n = 4$, then $n = 2$.

vertical angles are congruent

$\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$

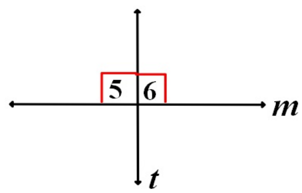


supplementary angles are 2 angles with a sum of 180°

complementary angles are 2 angles with a sum of 90°

perpendicular lines form right angles

$m \perp t$, $\angle 5 \cong \angle 6$



Key Concepts--Chapter 3

If 2 lines are parallel,

corresponding angles are congruent

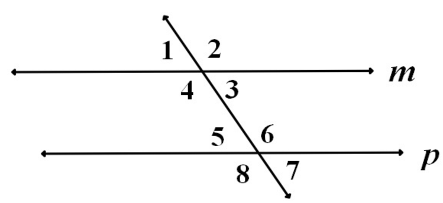
$\angle 1 \cong \angle 5$, $\angle 2 \cong \angle 6$, $\angle 3 \cong \angle 7$, $\angle 4 \cong \angle 8$

alternate interior angles are congruent

$\angle 3 \cong \angle 5$, $\angle 4 \cong \angle 6$

same-side interior angles are supplementary

$m\angle 4 + m\angle 5 = 180$, $m\angle 3 + m\angle 6 = 180$



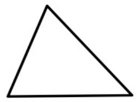
$m \parallel p$

Two lines can be proved parallel if:

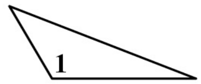
corresponding angles are congruent,
alternate interior angles are congruent,
same-side interior angles are supplementary,
or two lines are perpendicular to the same line.

Triangles

sum of angles of triangle = 180°

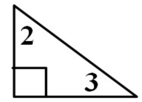


acute triangle
all angles < 90°



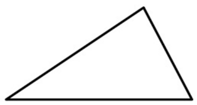
obtuse triangle

$m\angle 1 > 90$



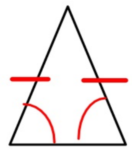
right triangle

$m\angle 2 + m\angle 3 = 90$



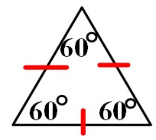
scalene triangle

no = sides



isosceles triangle

2 = legs and
2 = base angles

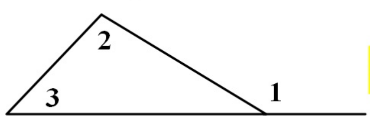


equilateral triangle
equiangular triangle

all sides = and
all angles 60°

Key Concepts--Chapter 3 **CONTINUED**

Exterior Angle Theorem



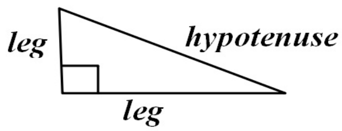
$m\angle 1 = m\angle 2 + m\angle 3$

Polygons with ***n*** *sides*

- **sum of interior angles is (n - 2)180**
- **sum of exterior angles is 360°**

A regular polygon has all sides equal and all angles equal.

Key Concepts--Chapter 4

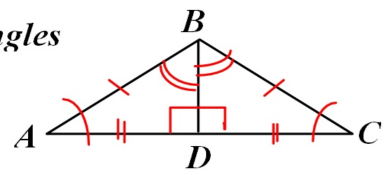


Ways to prove triangles are congruent:

SSS ≅, ASA ≅, SAS ≅, AAS ≅, HL ≅

CPCTC "corresponding parts of congruent triangles are congruent"

Isosceles Triangles



vertex angle $\angle ABC$

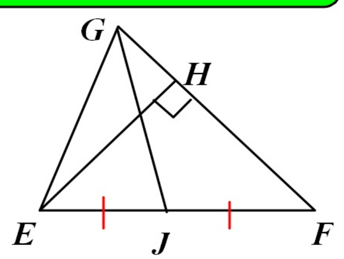
base angles $\angle A \cong \angle C$

base $\overline{AC}$

legs $\overline{AB} \cong \overline{CB}$

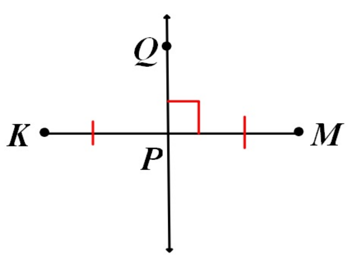
- *In a triangle, congruent sides are opposite from congruent angles.*

Key Concepts--Chapter 4 CONTINUED



$\overline{GJ}$ is a *median* of ΔEGF

$\overline{EH}$ is an *altitude* of ΔEGF

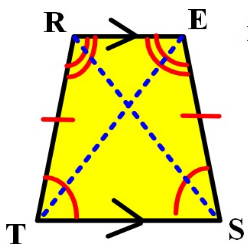


$\overleftrightarrow{PQ}$ is a *perpendicular bisector* of $\overline{KM}$

Key Concepts--Chapter 5

PROPERTIES OF QUADRILATERALS

	parallelogram	rectangle	rhombus	square
Opp. sides parallel	x	x	x	x
Opp. sides =	x	x	x	x
All sides =			x	x
Diagonals bisect each other	x	x	x	x
= diagonals		x		x
Perpendicular diagonals			x	x
Diagonals bisect opp. angles			x	x
Opp. angles =	x	x	x	x
4 = right angles		x		x

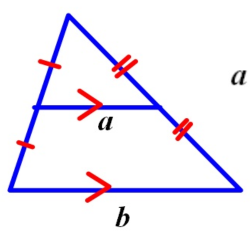


isosceles trapezoid REST

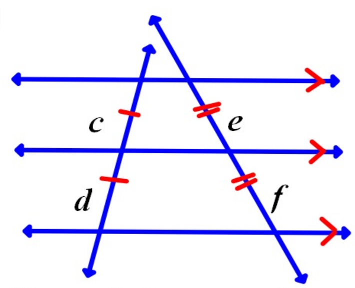
base angles = , legs = , bases parallel

diagonals = (RS = ET)

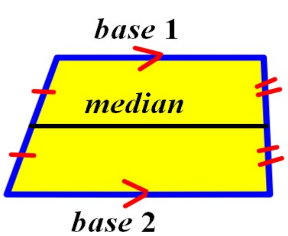
Key Concepts--Chapter 5 *CONTINUED*



$a = \frac{1}{2}b$



If $c = d$, **then** $e = f$.



in a trapezoid,

median $= \frac{1}{2}(\text{base 1} + \text{base 2})$

Key Concepts--Chapter 6

conditional **If a quadrilateral has 4 equal angles, then it is a rectangle.**

converse

inverse

contrapositive

indirect proof

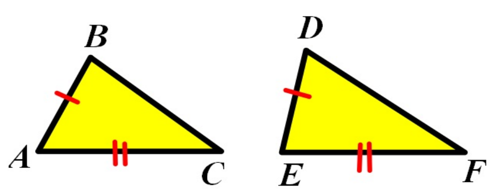
Given: $m\angle 1 + m\angle 2 \neq 90$

Prove: $\angle 1$ **and** $\angle 2$ **are not complementary angles**

The first sentence of the indirect proof:

Key Concepts--Chapter 6 continued

- **In a triangle, the longest side lies opposite from the largest angle.**
- **In a triangle, the sum of any 2 sides is greater than the 3rd side.**



SAS Inequality Thm.

If $AB = ED$, $AC = EF$, *and* $m\angle A < m\angle E$, *then* $BC < DF$.

SSS Inequality Thm.

If $AB = ED$, $AC = EF$, *and* $BC < DF$, *then* $m\angle A < m\angle E$.

Key Concepts--Chapter 13

For 2 points $A(x_1, y_1)$ **and** $B(x_1, y_1)$

distance from A **to** B
or length of $\overline{AB}$ $= \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

midpoint of $\overline{AB}$ $= \left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2} \right)$

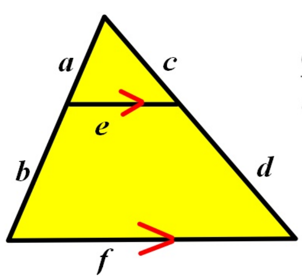
slope of $\overline{AB}$ $= \dfrac{y_1 - y_2}{x_1 - x_2}$

- *parallel lines have equal slopes*
- *slopes of perpendicular lines are negative reciprocals*

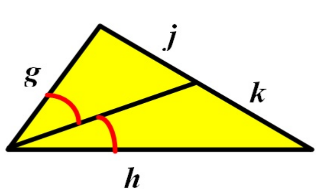
Key Concepts--Chapter 7

- *In similar polygons, corresponding sides are in proportion and corresponding angles are equal.*

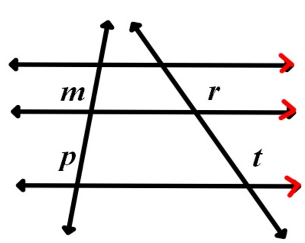
Ways to prove triangles similar: AA~ , SAS~ , SSS~



$\dfrac{a}{b} = \dfrac{c}{d}$ $\dfrac{a}{c} = \dfrac{b}{d}$ $\dfrac{e}{f} = \dfrac{a}{a+b}$



$\dfrac{g}{h} = \dfrac{j}{k}$



$\dfrac{m}{p} = \dfrac{r}{t}$