

<name>

Class: Honors Geometry

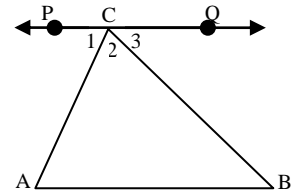
Date: 9/14/06

Topic: Lesson 3-3 (Parallel Lines & Triangle Angle Sum Theorem)

Theorem 3-7

Triangle Angle-Sum Theorem

The sum of the measures of  $\angle$ 's is 180



Proof:

Line $PQ \parallel \overline{AB}$	Given/constructed
$\angle A \cong \angle 1$	Thm 3-1
$\angle B \cong \angle 3$	Thm 3-1
$m\angle 1 + m\angle 3 + m\angle 2 = 180$	$\angle$ Add Post
$m\angle A + m\angle B + m\angle C = 180$	Subst POE

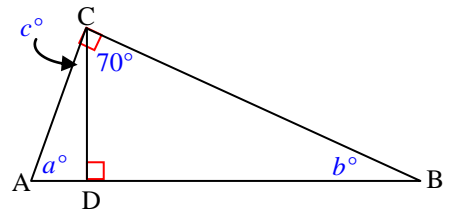
Q.E.D.

Example (not in book)

Given:  $\angle ACB$  is a right angle

$\overline{CD} \perp \overline{AB}$

Find  $a, b$  &  $c$ .



$c = 90 - 70 = 20$  (complementary  $\angle$ 's)

$a + c + 90 = 180$  (Theorem 3-7)

$a = 180 - 90 - c = 90 - 20 = 70$

$b + 70 + 90 = 180$  (Theorem 3-7)

$b = 180 - 160 = 20$

Classifying triangles

Need both  $\angle$  and side relationship:

By  $\angle$ :

- Equiangular: all  $\angle$ 's  $\cong$
- Acute: all  $\angle$ 's acute
- Right: 1  $\angle$  is rt  $\angle$
- Obtuse: 1  $\angle$  obtuse

...and in combination w/side:

- Equilateral: all sides  $\cong$
- Isosceles: 2 sides  $\cong$
- Scalene: no sides  $\cong$

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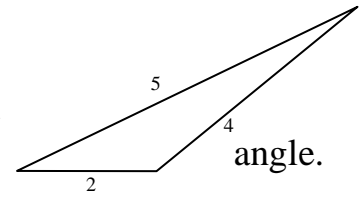
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Example

Classify:

Consider sides: none are congruent.

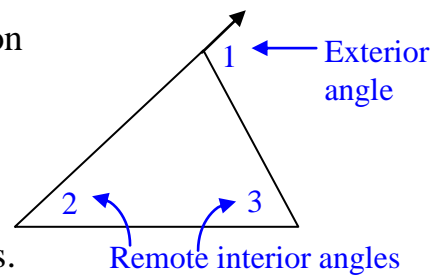
Consider  $\angle$ 's: there is 1 obtuse



...obtuse scalene triangle

Exterior  $\angle$ 's

$\angle$  formed by side and extension of adjacent side.



Remote interior  $\angle$ 's

2 int  $\angle$ 's of tri at other vertices.

Theorem 3-8

Triangle Exterior Angle Theorem

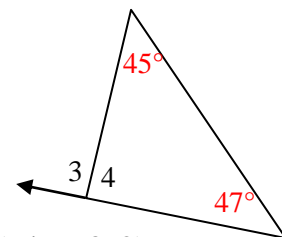
Measure ea ext  $\angle$  = sum measure 2 remote int  $\angle$ 's

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

Example

Problem #28, pg 135

Find each missing angle measure.



$$m\angle 3 = 45 + 47 = 92$$

(Thm 3-8)

$$m\angle 3 + m\angle 4 = 180$$

(Suppl  $\angle$ 's)

$$m\angle 4 = 180 - m\angle 3 = 180 - 92 = 88$$

(Subst POE)