4 Angles in Triangles

October 4, 2020   5:08 PM

FOM 11: Ch 2 Geometry

Day 4: Angle Properties in Triangles
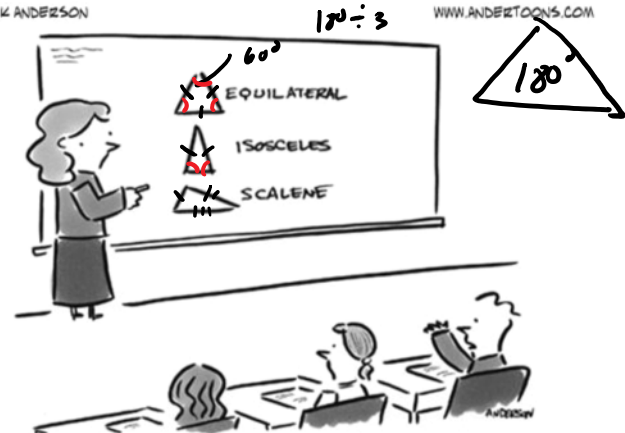
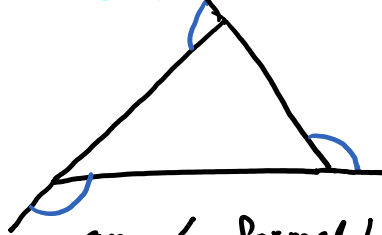**Investigation:** The sum of *interior angles* in a triangle is ___180°___
Prove it by cutting off the angles in the triangle and then putting them together!
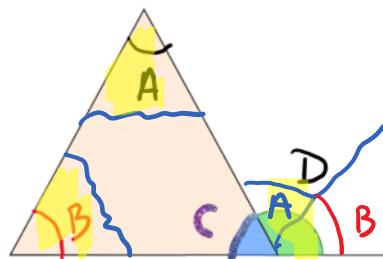
Today we explore *exterior* angles!

Exterior Angle: ___an ∠ formed by 1 side of a polygon + by extending the adjacent side___

Investigation: Take a triangle, mark the *a, b,* and *c* angles. Tear off opposite interior angles, *a* and *b*. How can you use *a* and *b* to determine the measure of exterior angle *d*? of *c*?
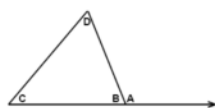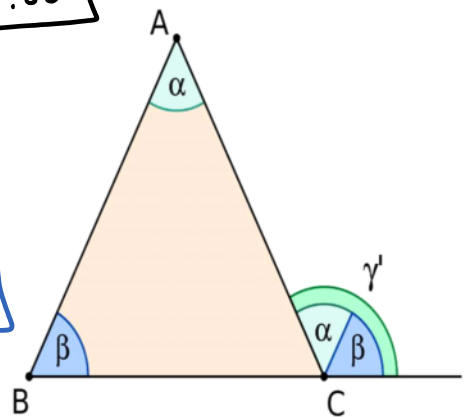
$$\angle D = \angle A + \angle B$$

exterior ∠

opposite (non-adjacent) interior ∠'s

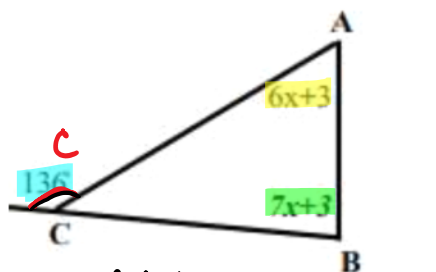Ms. Kamber

Example 1: Find the measure of indicated angle.

$C = \underline{80° + 5° = 85°}$
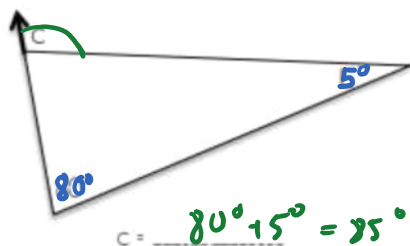
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Example 2: Find the measure of indicated angle.

$105° - 65° = 40°$

A) 35°   B) 75°

C) 40°   D) 36°
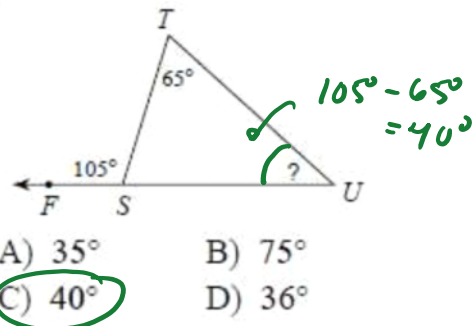
Example 3: Find x and the use it to find the measures of ∠A and ∠B.

$\angle A + \angle B = \angle C \rightarrow ext.$

$6x+3 + 7x+3 = 136°$

$13x + 6 = 136°$

$ -6 \qquad -6$

$\dfrac{13x}{13} = \dfrac{130°}{13}$

$x = 10°$

$\angle A = 6x+3$
$= 6(10)+3 = \boxed{63°}$

$\angle B = 7x+3$
$= 7(10)+3 = \boxed{73°}$

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Example 4: Find x and the use it to find the measures of ∠B and ∠C.
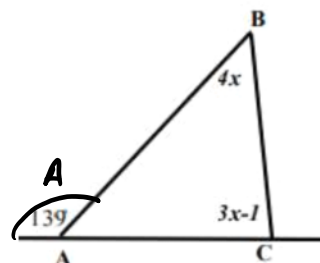
$\angle A = \angle B + \angle C$

ext   opp. int

$139° = 4x + 3x - 1$

$139° = 7x - 1$

$ +1 \qquad\qquad +1$

$\dfrac{140°}{7} = \dfrac{7x}{7}$

$x = 20°$

$\angle B = 4x = 4(20)° = \boxed{80°}$

$\angle C = 3x - 1 = \boxed{59°}$

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Example 5: Find x and the use it to find the measures of $\angle A$ and $\angle B$.
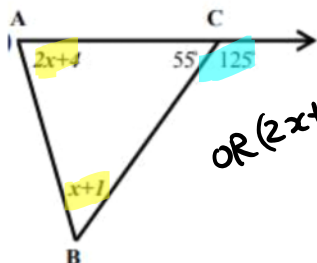
A   C

$2x+4$ 55 / 125

$x+1$

B

OR $(2x+4)+(x+1)+55=180°$

$(2x+4)+(x+1)=125$

$3x+5=125$
$\quad -5 \quad -5$
$\overline{\quad 3x = 120 \quad}$
$\quad \dfrac{3x}{3} = \dfrac{120}{3}$
$\boxed{x=40°}$

$\angle A = 2x+4$
$\quad = 2(40)+4$
$\quad = \boxed{84°}$

$\angle B = x+1$
$\quad = 40+1$
$\quad = \boxed{41°}$

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Example 6: Make up your own question involving an exterior angle!

Example 7: Determine $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$.

1

65°

6

2   90°

60°

25°   3

4   120°

5
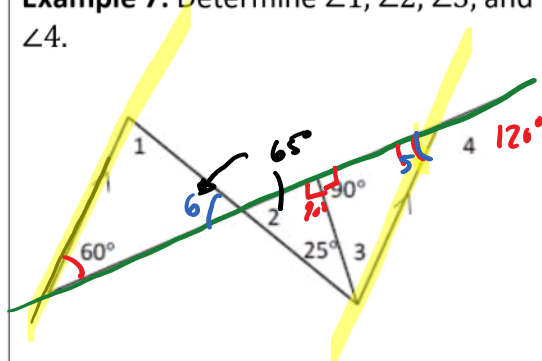
$\angle 2 = 180° - 90° - 25° = 65°$

$\angle 5 = 60°$ alt. int. to 60°

$\angle 4 = 180° - \angle 5$
$\quad = 180° - 60°$
$\quad = 120°$

$\angle 1 = 180° - 60° - 65°$
$\quad = 55°$ ✓

Assignment:
- "What do you call a cook that leaves Arby's to work at McDonalds?"
- Triangles Sheet: #1-3, 4 or 10, 5-8, 11.

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