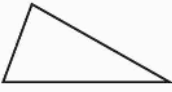
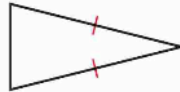
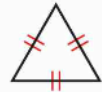


Section 4.1: Apply Triangle Sum Properties

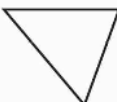
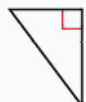
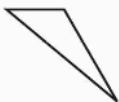
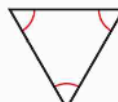
EQ: How can you find the measure of the 3rd \angle given the other two in a Δ ?

KEY CONCEPT *For Your Notebook*

Classifying Triangles by Sides

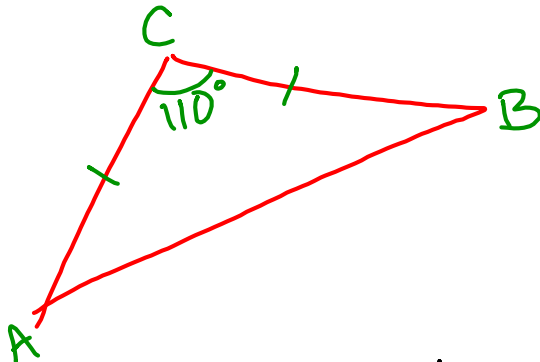
<p>Scalene Triangle</p>  <p>No congruent sides</p>	<p>Isosceles Triangle</p>  <p>2 congruent sides</p>	<p>Equilateral Triangle</p>  <p>3 congruent sides</p>
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Classifying Triangles by Angles

<p>Acute Triangle</p>  <p>3 acute angles</p>	<p>Right Triangle</p>  <p>1 right angle</p>	<p>Obtuse Triangle</p>  <p>1 obtuse angle</p>	<p>Equiangular Triangle</p>  <p>3 congruent angles</p>
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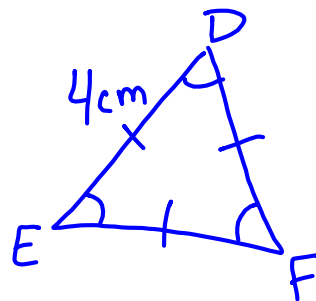
A1. Sketch and properly mark and label the describe triangle.

a. Obtuse isosceles triangle ABC with vertex angle C.



→ Vertex angle is between the 2 \cong sides of an isosceles Δ

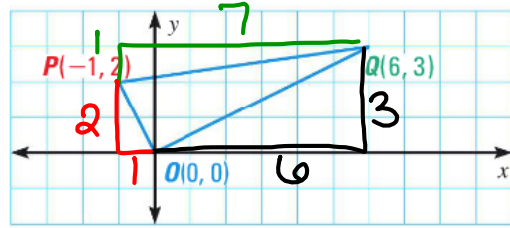
b. Equilateral equiangular ΔDEF with perimeter 12 cm.



$$P = 12$$

$$\frac{\quad}{3 \text{ sides}} = 4 \text{ cm}$$

A2. Classify $\triangle PQO$ by its sides.



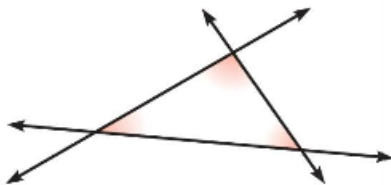
$$QO = \sqrt{6^2 + 3^2} = \sqrt{36 + 9} = \sqrt{45}$$

$$PQ = \sqrt{7^2 + 1^2} = \sqrt{49 + 1} = \sqrt{50}$$

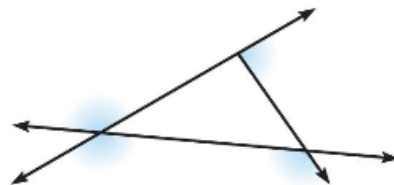
$$PO = \sqrt{2^2 + 1^2} = \sqrt{4 + 1} = \sqrt{5}$$

Scalene \triangle
No \cong sides

ANGLES When the sides of a polygon are extended, other angles are formed. The original angles are the **interior angles**. The angles that form linear pairs with the interior angles are the **exterior angles**.



interior angles



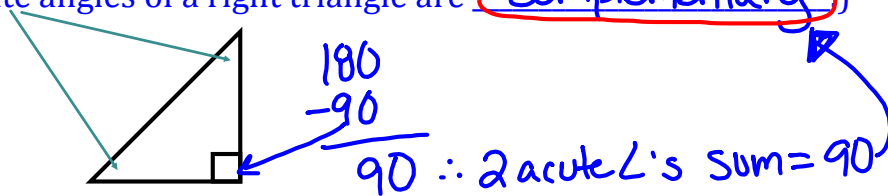
exterior angles

Investigation 1:

- Draw a triangle (use straightedge)
- Cut out the triangle
- Label inside each angle: A, B, C
- Tear off each angle
- Arrange tear-offs adjacently
- Make an observation

Theorem 4.1: Triangle Sum Theorem \triangle Sum Thm.

The sum of the measures of the interior angles of a triangle is 180° .
 (The acute angles of a right triangle are Complementary)



A3. Find the missing angle measure represented by x .

a. x° 125° 20°

Handwritten work:
 180
 $- 125$
 $- 20$

 $x = 35^\circ$

b. x° x°

Handwritten work:
 Rt. \triangle
 $x + x = 90$
 $2x = 90$
 $\frac{2x}{2} = \frac{90}{2}$
 $x = 45^\circ$

c. 35° x°

Handwritten work:
 Rt \triangle
 $35 + x = 90$
 $x = 55^\circ$

Investigation 2:

Draw a triangle with a "tail"

Measure outside obtuse angle formed by "tail"

Measure inside angles not adjacent outside angle

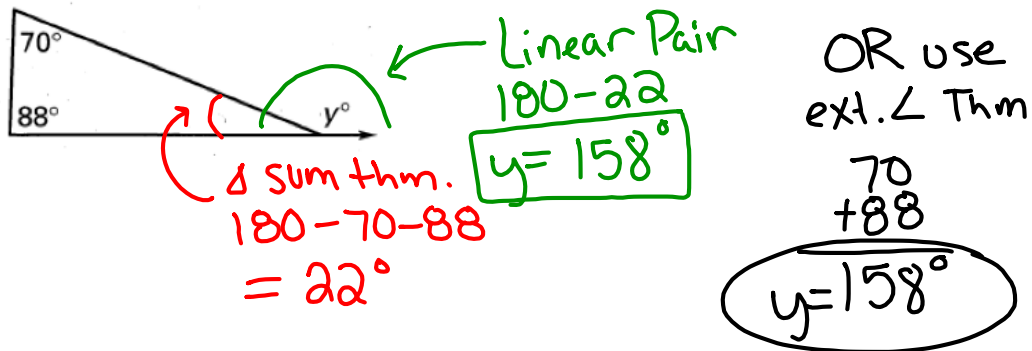
Fill in a row on whiteboard with measures

Make an observation

Theorem 4.2: Exterior Theorem Ext. \angle Thm

The measure of an exterior ^{ANGLE} angle of a triangle is equal to the sum of of the two nonadjacent interior angles.

A4. Find the value of y two different ways.



A5. Find $m\angle 3$. Give the reason(s).

Δ Sum thm.
 180
 $- 45$
 $- 65$

 $m\angle 1 = 70^\circ$

Linear Triple
 $180 - \angle 1 - 45^\circ = \angle 2$
 $180 - 70 - 45 = 65$
 $m\angle 2 = 65^\circ$

Δ Sum Thm.
 $180 - 65$
 $- 20$

 $m\angle 3 = 95^\circ$

Sec 4.1 Summary:

A Δ s \angle s add to 180° so given 2 \angle s subtract them from 180° to get the 3rd \angle .