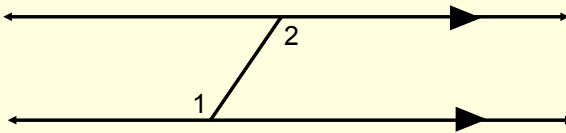


Bellwork 10/10/2011

Classify each angle as acute, obtuse, or right.

1. 90° right
2. 72° acute
3. 116° obtuse

4. How do you know that $\angle 1 \cong \angle 2$?



Alternate Interior \angle 's Thm.




Geometry
4.1 Apply Triangle Sum Properties
Standard(s): 3,9

Vocabulary:





1. **Triangle:** A polygon with three sides.
2. **Interior Angles:** Angles inside the triangle that form the vertices.
3. **Exterior Angles:** Angles that form linear pairs with the interior angles (outside the triangle).
4. **Corollary:** A statement that can be proved easily using a given theorem.

KEY CONCEPT *For Your Notebook*

Classifying Triangles by Sides

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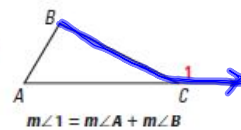
Classifying Triangles by Angles

<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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THEOREM *For Your Notebook***THEOREM 4.2** Exterior Angle Theorem

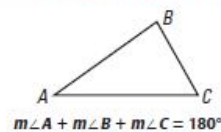
The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

Proof: Ex. 50, p. 223

**THEOREM** *For Your Notebook***THEOREM 4.1** Triangle Sum Theorem

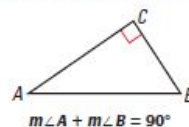
The sum of the measures of the interior angles of a triangle is 180° .

Proof: p. 219; Ex. 53, p. 224

**COROLLARY** *For Your Notebook***Corollary to the Triangle Sum Theorem**

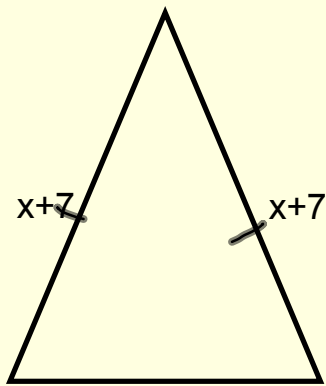
The acute angles of a right triangle are complementary.

Proof: Ex. 48, p. 223

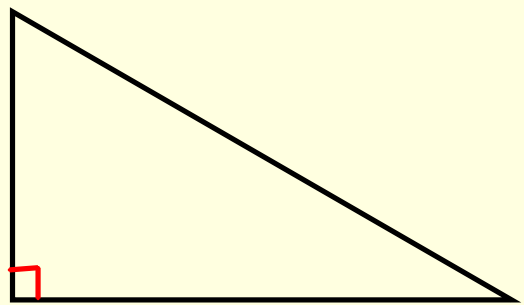


Classify Triangles by Sides and by Angles

Classify the triangles shown by its sides and angles.



Isosceles



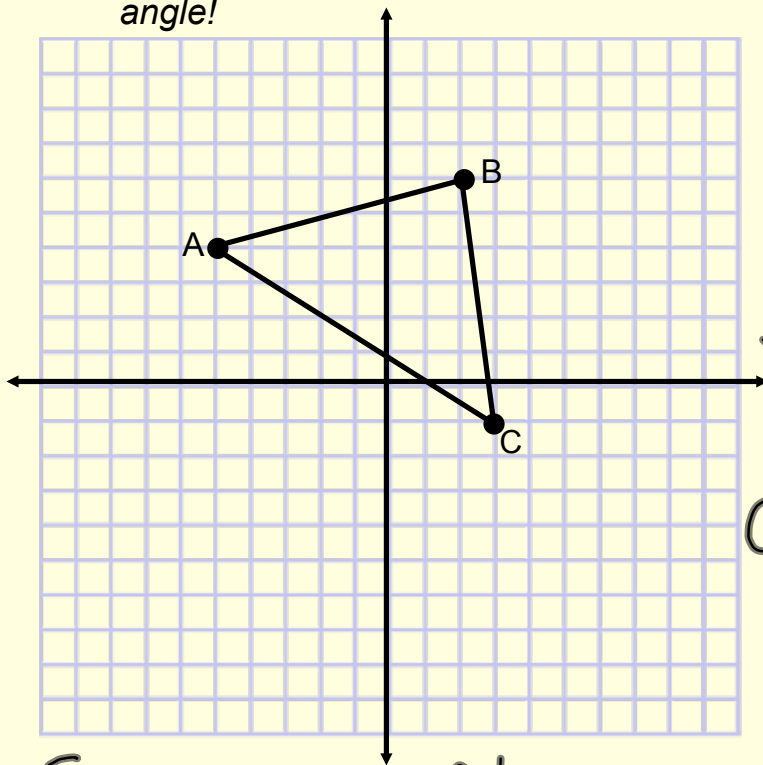
Right

Classify a Triangle in a Coordinate Plane

Classify $\triangle ABC$ by its sides and by its angles. Then show if the triangle is a right triangle.

$$A(-5, 4), B(2, 6), C(3, -1)$$

Note: Look for perpendicular slope to find if it's a right angle!



$$AB = \frac{6-4}{2-(-5)} = \frac{2}{7}$$

$$BC = \frac{-1-6}{3-2} = -\frac{7}{1}$$

$$CA = \frac{-1-4}{3-(-5)} = -\frac{5}{8}$$

Scalene, No right \triangle

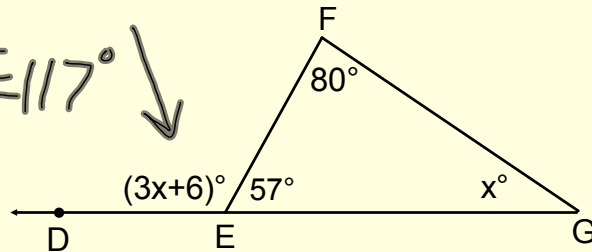
Find an Angle Measure

Find $m\angle DEF$.

$$3(37) + 6$$

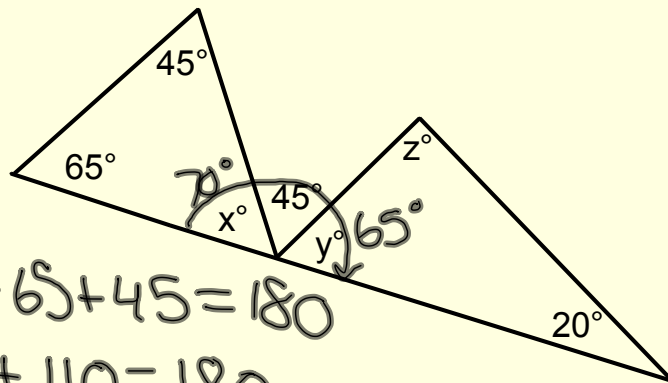
$$111 + 6$$

$$m\angle DEF = 117^\circ \downarrow$$



$$\begin{aligned} x + 80 &= 3x + 6 \\ -x \quad -6 & \quad -x \quad -6 \\ \hline 2x &= 74 \\ x &= 37 \end{aligned}$$

Find the value of each variable.



$$x + 65 + 45 = 180$$

$$x + 110 = 180$$

$$x = 70$$

$$y + 45 + 70 = 180$$

$$y + 115 = 180$$

$$y = 65$$

$$z + 65 + 20 = 180$$

$$z + 85 = 180$$

$$z = 95$$

Find Angle Measures Given Equations

In $\triangle ABC$, $m\angle A = m\angle B + 27^\circ$ and $m\angle C = m\angle B - 21^\circ$. Find the measure of each angle.

$$m\angle A = 85^\circ$$

$$m\angle B = 58^\circ$$

$$m\angle C = 37^\circ$$

$$m\angle A + m\angle B + m\angle C = 180$$

$$m\angle B + 27 + m\angle B + m\angle B - 21 = 180$$

$$3m\angle B + 6 = 180$$

$$\begin{array}{r} -6 -6 \\ \hline \end{array}$$

$$\frac{3}{3} m\angle B = \frac{174}{3}$$

$$m\angle B = 58^\circ$$

Homework Assignment

Worksheet 4.1B

