

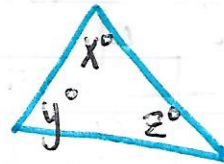
7.3 extension - Angle Measures of Triangles

EQ: In what ways can you find the angle measurements of a triangle?

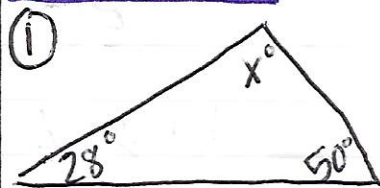
Sum of the angle measures of a triangle.

* When you add up all 3 angles you get a sum of 180° .

Formula: $x + y + z = 180^\circ$



Example 1: Finding Angle Measures.



$$28^\circ + 50^\circ + x^\circ = 180^\circ$$

$$78^\circ + x^\circ = 180^\circ$$

$$\begin{array}{r} -78 \\ \hline \end{array}$$

$$x = 102^\circ$$



$$45^\circ + x^\circ + 90^\circ = 180^\circ$$

$$x^\circ + 135^\circ = 180^\circ$$

$$\begin{array}{r} -135 \quad -135 \\ \hline \end{array}$$

$$x = 45^\circ$$

Example 2: Tell whether a triangle can have the given measures.

① $115.1^\circ, 47.5^\circ, 93^\circ$

$$115.1 \leftarrow \text{can not}$$

$$47.5 \quad \text{have 2}$$

$$93.0 \leftarrow \text{obtuse angles}$$

$$\begin{array}{r} 115.1 \\ 47.5 \\ 93.0 \\ \hline 255.6 \end{array}$$

NO

② $70^\circ, 20^\circ, 90^\circ$

$$70$$

$$20$$

$$90$$

$$\hline 180$$

Yes

add them up to see if they equal 180

Example 3: The measures of two supplementary angles have a ratio of 5:4. What is the measure of the larger angle?

TWO approaches: ratio table or equation



Ratio Table

larger \angle	5	\rightarrow 100
smaller \angle	4	\rightarrow 80
add up	9	180

(Note: Red arrows and labels $\times 20$ indicate the scaling factor from the ratio to the actual angle measures.)

Larger \angle is 100°

Equation

$$5x + 4x = 180$$

$$\frac{9x}{9} = \frac{180}{9}$$

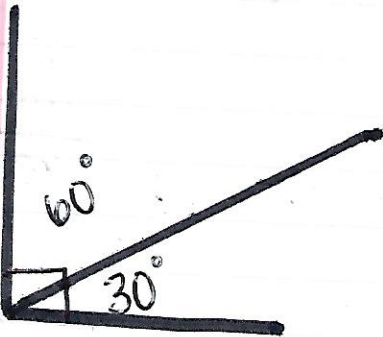
$$x = 20$$

$$5(20) = 100$$

Larger $\angle = 100^\circ$

Draw a pair of adjacent complementary angles with the given measure. ^{$= 90^\circ$}

- ① 30°
 $90 - 30 = 60^\circ$
 $30^\circ + 60^\circ$



- ② 75°
 $90 - 75 = 15^\circ$
 $75^\circ + 15^\circ$

