

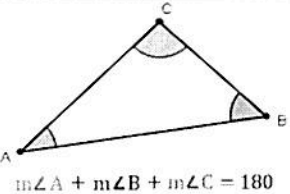
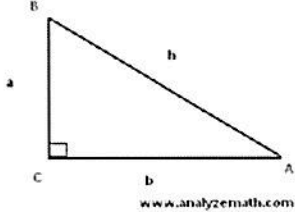
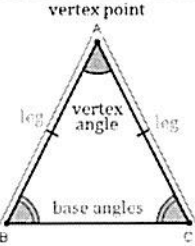
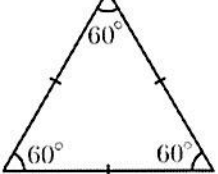
Name: Kelly

Date: _____

UNIT 1B

LESSON 12

AIM: HOW DO WE SOLVE FOR UNKNOWN ANGLES IN A TRIANGLE?

DIAGRAM	FACTS
	<p>The sum of the 3 angle measures of any triangle is <u>180°</u></p>
	<p>When one angle of a triangle is a right angle, the other two angles must sum to <u>90°</u> degrees. * complementary \angle's! *</p>
	<p>Base angles and corresponding sides of an <u>isosceles</u> triangle are <u>equal</u> in measure</p>
	<p>Each angle of an <u>equilateral</u> triangle has a measure of <u>60°</u></p>

In each figure, determine the measures of the unknown (labeled) angles. Give reasons for your calculations.

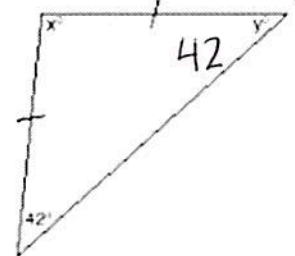
1. Tina wants to sew a piece of fabric into a scarf in the shape of an isosceles triangle, as shown in the accompanying diagram. What are the values of x and y ?

$$180 - 42 - 42 = 96^\circ$$

$$x = y = 42^\circ$$

$$x = 96^\circ$$

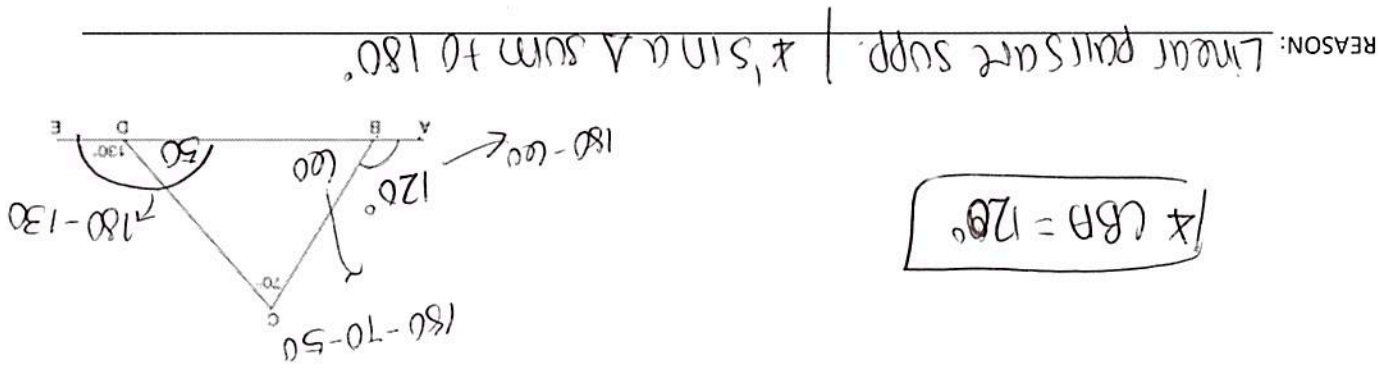
isosceles triangle!



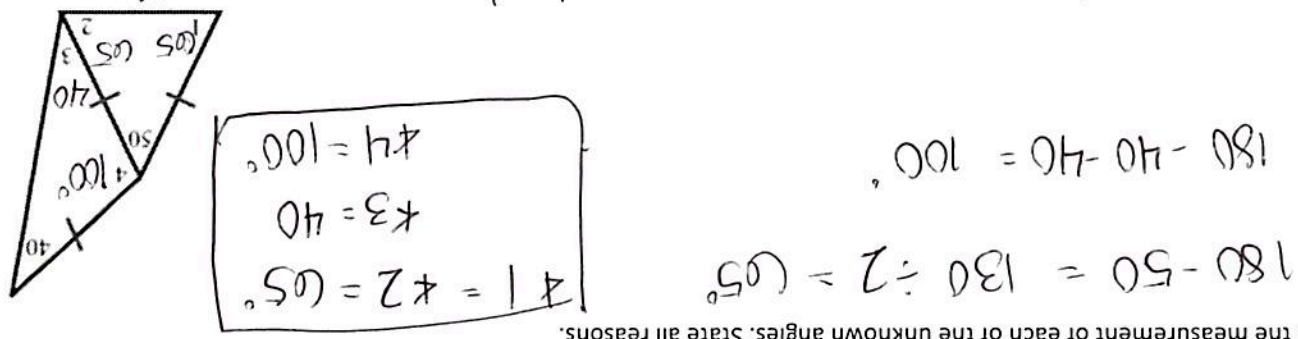
REASON: ① Base \angle 's of isosceles Δ 's are \cong

② \angle 's in a Δ sum to 180°

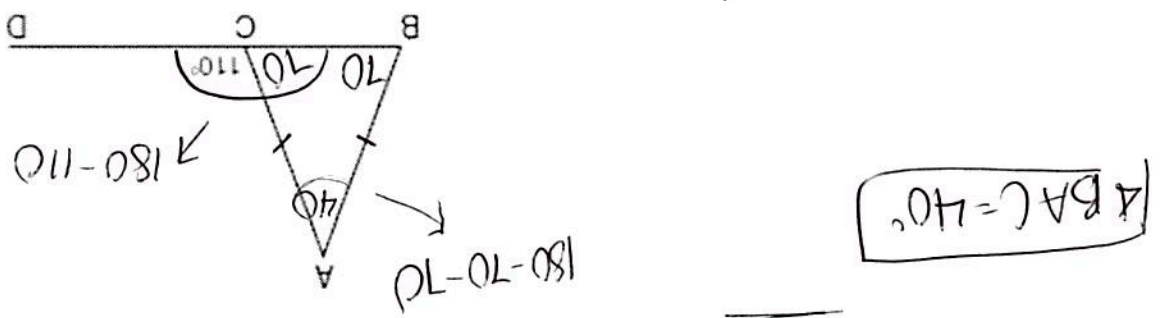
2. In the accompanying diagram of $\triangle ABC$, $m\angle C = 70^\circ$, $m\angle CDE = 130^\circ$, and side is extended to A and to E. Find $m\angle CBA$.



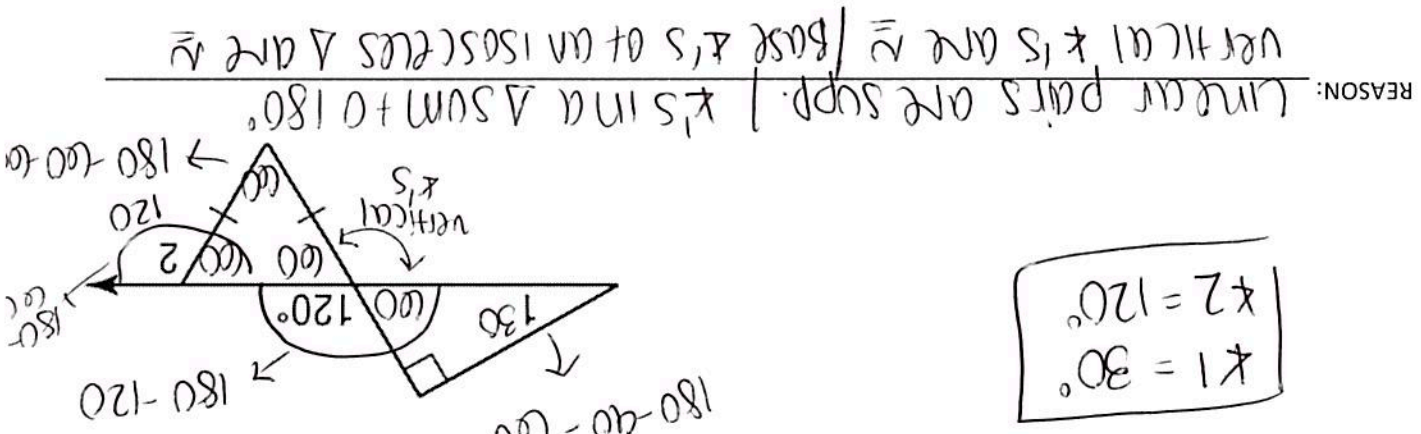
3. Find the measurement of each of the unknown angles. State all reasons.



4. In the accompanying diagram of triangle ABC, $\overline{AB} \cong \overline{AC}$, and exterior angle $\angle ACD = 110^\circ$. What is the measure of $\angle BAC$?

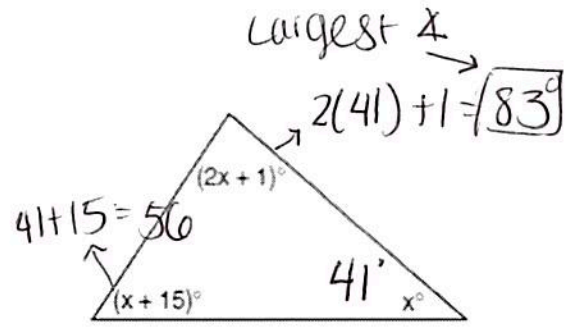


5. What are the measures of $\angle 1$ and $\angle 2$?



6. What is the largest angle in the accompanying triangle?

$$\begin{aligned} x + x + 15 + 2x + 1 &= 180 \\ \underline{x + x + 15} &= \underline{2x + 1} \\ 4x + 16 &= 180 \\ 4x &= 164 \\ x &= 41 \end{aligned}$$



REASON: x 's in a Δ sum to 180°

* 7. If the angle measures of a triangle are $2x$, $3x - 15$ and $7x + 15$, then what type of triangle is it?

$$\begin{aligned} 2x + 3x - 15 + 7x + 15 &= 180 \\ \underline{2x + 3x - 15} &+ \underline{7x + 15} \\ 12x &= 180 \\ x &= 15 \end{aligned}$$

$$\begin{aligned} 2(15) &= 30^\circ \\ 3(15) - 15 &= 30^\circ \\ 7(15) + 15 &= 120^\circ \\ \text{Isosceles } \Delta \end{aligned}$$

REASON: An isosceles Δ has 2 \cong base x 's

8. Triangle PQR has angles in the ratio of 2:3:5. What type of triangle is PQR ?

* ratios = x 's!

$$\begin{aligned} 2x + 3x + 5x &= 180 & 2(18) &= 36 \\ 10x &= 180 & 3(18) &= 54 \\ x &= 18 & 5(18) &= 90 \\ & & \text{Right } \Delta \end{aligned}$$

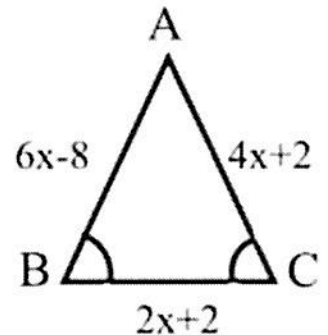
REASON: Right Δ 's have 1 90° x

9. Determine the measurement of each side in the given triangle.

$$\begin{aligned} 6x - 8 &= 4x + 2 \\ \underline{-4x + 8} & \quad \underline{-4x + 8} \\ 2x &= 10 \\ x &= 5 \end{aligned}$$

Isosceles Δ !

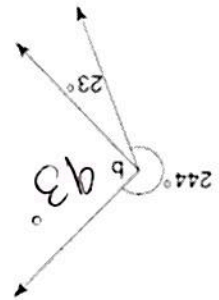
$$\begin{aligned} 6(5) - 8 &= 22 \\ 4(5) + 2 &= 22 \\ 2(5) + 2 &= 12 \end{aligned}$$



REASON: Isosceles Δ 's have 2 \cong sides

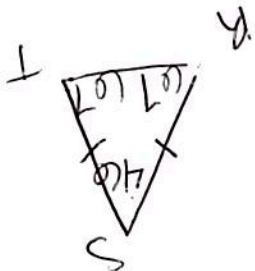
HOMWORK

1. What is the measure of $\angle b$?



$$360 - 244 - 23 = 93$$

2. In $\triangle RST$, $m\angle RST = 46^\circ$ and $RS \cong ST$, find $m\angle STR$.

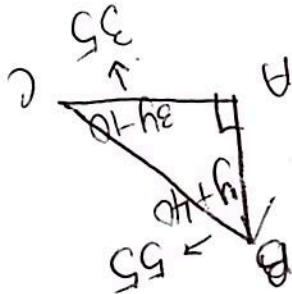


$$180 - 46 \div 2 =$$

$$\angle STR = 67^\circ$$

3. In right triangle ABC , $m\angle C = 3y - 10$, $m\angle B = y + 40$ and $m\angle A = 90$. What type of right triangle is ABC ?

- a. Scalene
- b. Isosceles
- c. Equilateral
- d. Obtuse



$$3y - 10 + y + 40 = 90$$

$$4y + 30 = 90$$

$$4y = 60$$

$$y = 15$$

4. The measure of angles in a triangle are 2:3:4. In degrees, the measure of the largest triangle is....

$$2x + 3x + 4x = 180$$

$$9x = 180$$

$$x = 20$$

$$2(20) = 40$$

$$3(20) = 60$$

$$4(20) = 80^\circ$$

5. If two angles of a triangle are congruent and complementary, then the triangle is

- a. Isosceles and Right
- b. Scalene and Right
- c. Isosceles and Obtuse
- d. Scalene and Acute