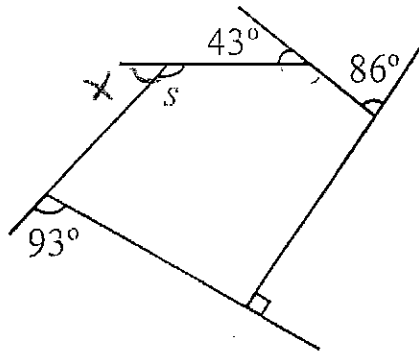


5. (8 points) Find s in the following polygon. Lines that appear straight are straight.



All ext \angle s of n -gon = 360°

$$86 + 43 + 90 + 93 + x = 360$$

$$129 + 183 + x = 360$$

$$\begin{array}{r} 312 + x = 360 \\ -312 \quad -312 \\ \hline x = 48 \end{array}$$

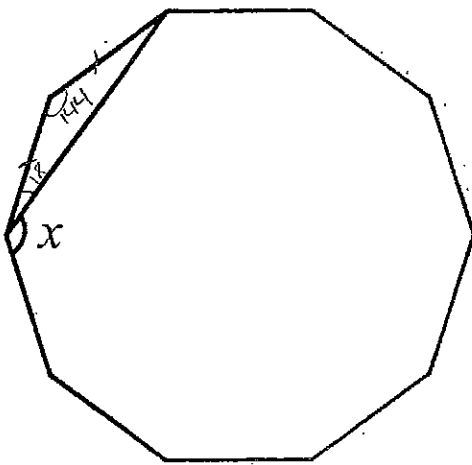
$$x + s = 180 \text{ (}\angle\text{s on a line)}$$

$$48 + s = 180$$

$$\begin{array}{r} 48 + s = 180 \\ -48 \quad -48 \\ \hline s = 132 \end{array}$$

$s = 132^\circ$

6. (10 points) The polygon below is a regular decagon. Find x .



$$\frac{(n-2)180}{n} = \frac{(10-2)180}{10} = \frac{8(180)}{10}$$

$$\frac{1440}{10} = 144^\circ = \angle \text{ of decagon}$$

isosceles Δ so $180 - 144 = 36$

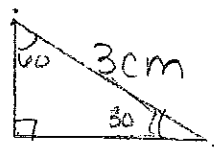
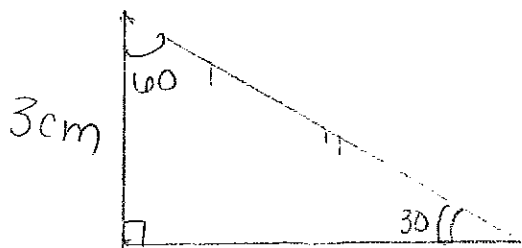
2 base \angle s = 36 so 1 base $\angle = 36$

Base $\angle = 18$

$$\begin{array}{r} 18 + x = 144 \\ -18 \quad -18 \\ \hline x = 126 \end{array}$$

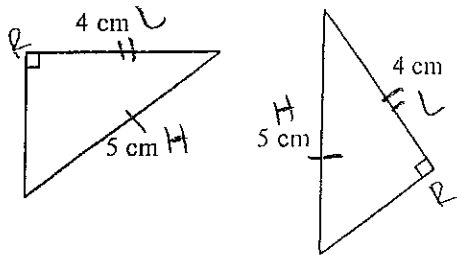
$x = 126^\circ$

7. (5 points) If two triangles have interior angles which measure 30 degrees, 60 degrees and 90 degrees and both triangles have a side of length 3cm, are the two triangles ^{always} congruent? If so, explain why. If not, give an example that shows it.



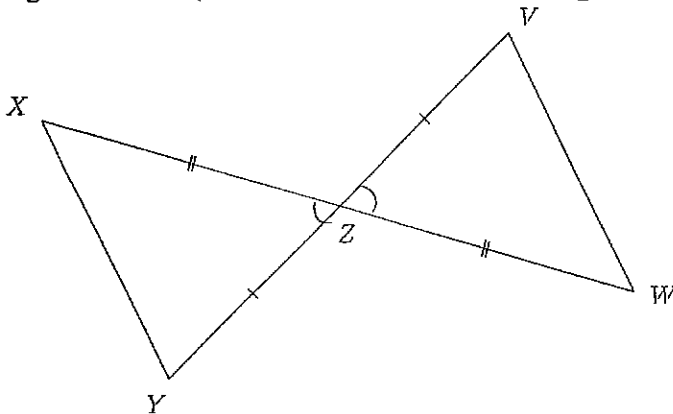
* Both Δ have \angle s 90° , 60° and 30° and a side length of 3cm but they are not congruent!

8. (5 points) Determine whether the triangles pictured are congruent. If they are congruent, say which test you used to determine this. (Figures are not necessarily to scale.)



Yes, they are congruent by the
 Right (90° \angle 's)
 Hypotenuse (5 cm)
 Leg (4 cm)
 ' or
 RHL test!

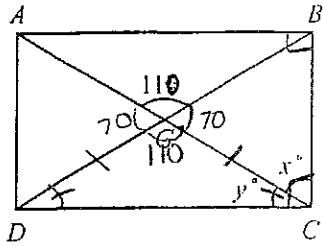
9. (8 points) Give a teacher's solution to show that angle X is congruent to angle W in the figure below. (Hint: First show that the triangles are congruent...)



$\triangle YZX \cong \triangle VZW$ by
 the SAS test
 Since
 $\overline{YZ} \cong \overline{VZ}$ (given)
 $\angle YZX \cong \angle VZW$ (vertical \angle 's)
 $\overline{XZ} \cong \overline{WZ}$ (given)

\therefore CPCTC show that
 $\angle X \cong \angle W$!

11. (8 points) $ABCD$ is a rectangle. Find the values of x and y .



$x + y = 90^\circ$ (prop of rect.)
 $\angle DGC = 110^\circ$ (vertical \angle 's with $\angle BGA$)
 $\triangle DGC = \text{isosceles } \triangle$ (prop of rect.)

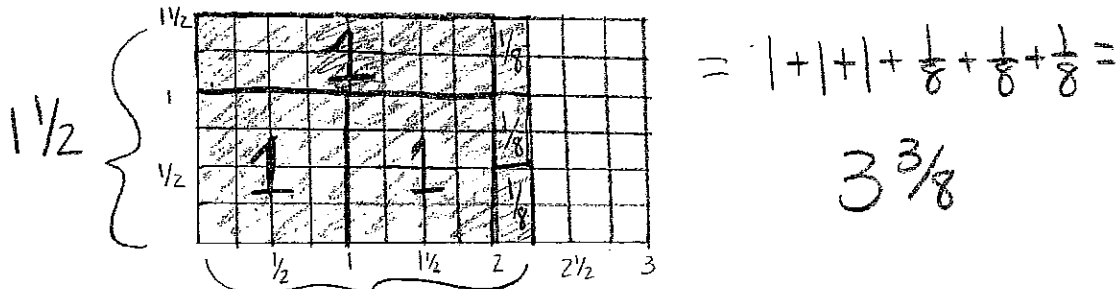
$$\text{so } y = \frac{180 - 110}{2} \quad y = \frac{70}{2} \quad y = 35^\circ$$

$$x + y = 90^\circ$$

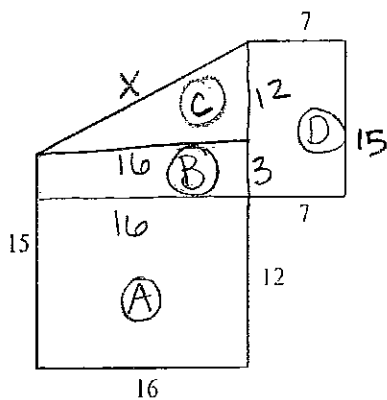
$$\begin{array}{r} x + 35 = 90 \\ -35 \quad -35 \\ \hline x = 55 \end{array}$$

$$\begin{array}{l} y = 35^\circ \\ x = 55^\circ \end{array}$$

12. (6 points) Use an area model to justify the fact that $2 \frac{1}{4} \times 1 \frac{1}{2} = 3 \frac{3}{8}$. (Draw a diagram and show your reasoning.)



13. (12 points) Find the area and perimeter of the given composite figure.



The Area

$$A = 16 \times 12 = 192 \text{ un}^2$$

$$B = 16 \times 3 = 48 \text{ un}^2$$

$$C = \frac{16 \times 12}{2} = \frac{192}{2} = 96 \text{ un}^2$$

$$D = 15 \times 7 = 105 \text{ un}^2$$

$$A + B + C + D = \text{Total Area}$$

$$192 \text{ un}^2 + 48 \text{ un}^2 + 96 \text{ un}^2 + 105 \text{ un}^2 =$$

$$\begin{array}{l} \text{Area} = \\ 441 \text{ un}^2 \end{array}$$

The Perimeter

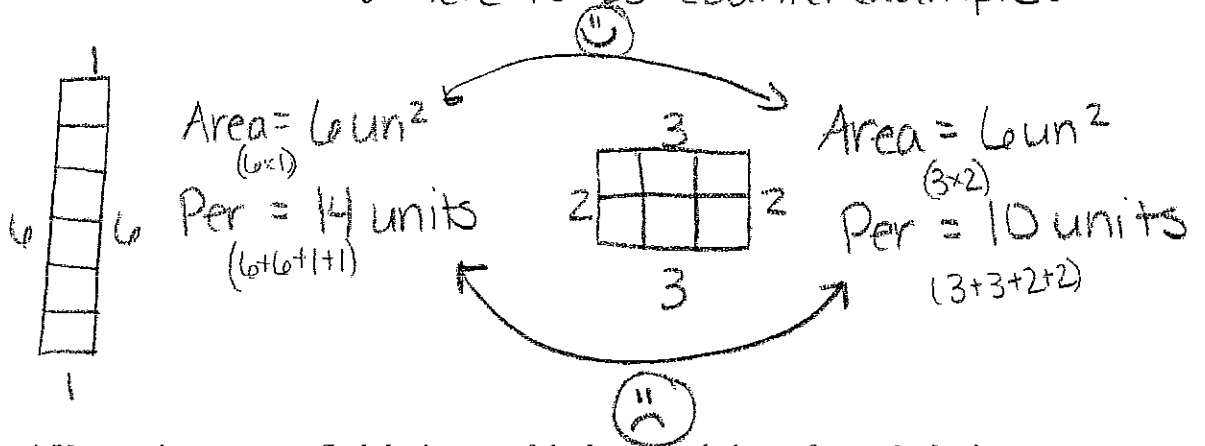
$$\text{Find } x \Rightarrow 16^2 + 12^2 = x^2 \Rightarrow 256 + 144 = x^2 \Rightarrow 400 = x^2 \quad \boxed{x = 20}$$

$$\text{Perimeter} = 20 + 7 + 15 + 7 + 12 + 16 + 15$$

$$\text{Perimeter} = 92 \text{ units}$$

14. (4 points) Fill in the blank: "In a right triangle, the perpendicular sides are called the legs."

15. (6 points) If two figures have the same area, must they also (always) have the same perimeter? If so, explain why. If not, give a counterexample and show that your counterexample works! **NO!** Here is a counterexample:



16. (6 points) Use tracing paper to find the image of the hexagon below after a clockwise rotation by angle ABC with center B. (Be precise and put your answer on this page.)

