3.1. Honors Geometry **DATE:** 11/1

Target 3A. Identify corresponding sides and corresponding angles in congruent triangles, and explain why they are congruent

Congruent Polygons

- We say two polygons are congruent ($\cong$) when the two figures have the same shape and size.
- Mathematically speaking, when two polygons are congruent their corresponding parts are congruent. This means that the corresponding sides are congruent and corresponding angles are congruent.

Example

$\Delta CAT \cong \Delta JSD$. List the congruent corresponding parts.

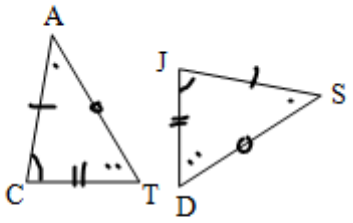
A

Example

$\Delta CAT \cong \Delta JSD$. List the congruent corresponding parts. → sides and angles

SIDES: $\overline{CA} \cong \overline{JS}$, $\overline{AT} \cong \overline{SD}$, $\overline{CT} \cong \overline{JD}$

ANGLES: $\angle C \cong \angle J$, $\angle A \cong \angle S$, $\angle T \cong \angle D$



Complete the congruence statements.

$\overline{AC} \cong$ $\overline{SJ}$ $\overline{DJ} \cong$ $\overline{TC}$

$\angle ATC \cong$ $\angle SDJ$ $\angle SJD \cong$ $\angle ACT$

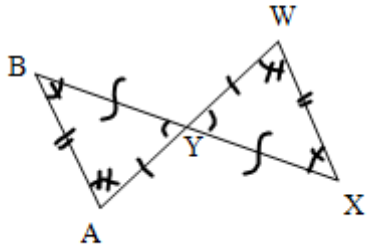
$\Delta TCA \cong$ ΔDJS $\Delta DSJ \cong$ ΔTAC

Example

$\Delta ABY \cong \Delta WXY$. List the congruent corresponding parts.

SIDES: $\overline{AB} \cong \overline{WX}$, $\overline{BY} \cong \overline{XY}$, $\overline{AY} \cong \overline{WY}$

ANGLES: $\angle A \cong \angle W$, $\angle B \cong \angle X$, $\angle BYA \cong \angle XYW$



Complete the congruence statements.

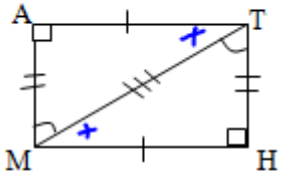
$\overline{YB} \cong$ $\overline{YX}$ $\overline{WX} \cong$ $\overline{AB}$

$\angle BYA \cong$ $\angle XYW$ $\angle YWX \cong$ $\angle YAB$

$\Delta AYB \cong$ ΔWYX $\Delta XYW \cong$ ΔBYA

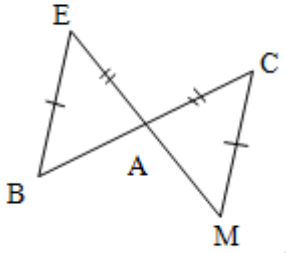
1. Identify the figures that can be proven congruent.
If there are congruent figures, write a congruence statement.

$\Delta AMT \cong \Delta ATM$



2. Identify the figures that can be proven congruent.
If there are congruent figures, write a congruence statement.

No. So no congruence statement can be written.



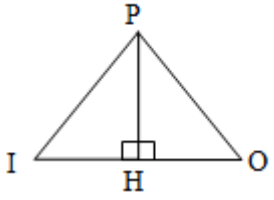
3. $\Delta HIP \cong \Delta HOP$. If $\overline{IP} = 13\text{cm}$, $\overline{IH} = 5\text{cm}$ and $\overline{OP} = 2x - 7$, then find the value of x.

$\overline{IP} \cong \overline{OP}$

$13 = 2x - 7$
$+7 \quad +7$

$\frac{20}{2} = \frac{2x}{2}$

$x = 10$

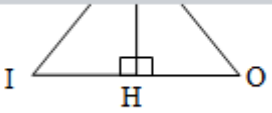


4. $\Delta ART \cong \Delta FUN$. If $\angle T = 39°$, $\angle F = 74°$, and $\angle A = (5x + 4)°$, then find the value of x.

$\angle A \cong \angle F$

$5x + 4 = 74$
$-4 \quad -4$
$5x = 70$
$\frac{5x}{5} = \frac{70}{5}$

$x = 14$

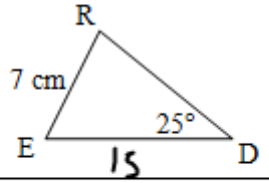


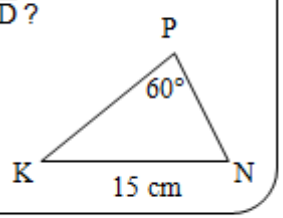
4. $\Delta ART \cong \Delta FUN$. If $\angle T=39°$, $\angle F=74°$, and $\angle A=(5x + 4)°$, then find the value of x.

5. In the diagram, $\Delta RED \cong \Delta PNK$. What is the measure of $\overline{ED}$?

$\overline{KN} \cong \overline{DE}$

So $\overline{ED}$ = 15cm





6. In the diagram, $\Delta EFG \cong \Delta HIJ$. What is the measure of $\angle H$?

$\angle E \cong \angle H$

$\angle F \cong \angle I$

$\angle G \cong \angle J$

$\therefore \angle H = 180 - 65 - 15$

$= 100°$

the sum of $\angle$s in Δ is always 180°!