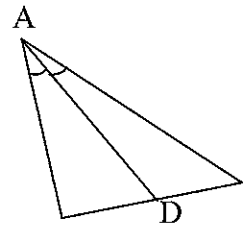
Honors Geometry
Unit 3 Review

Name: Key

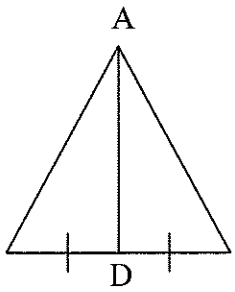
Describe segment AD as a median, altitude, angle bisector, both, or neither.

1.



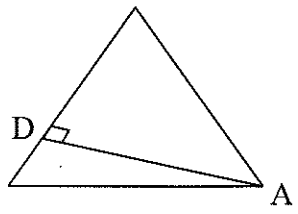
Angle bisector

2.



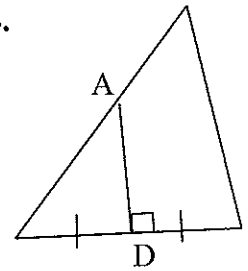
Median

3.



Altitude

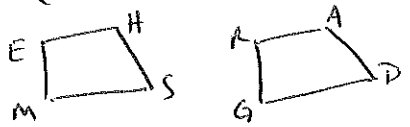
4.



Neither

For #5, list ALL congruent corresponding parts of the polygons.

5. Quadrilaterals MEHS ≅ GRAD.



Congruent Sides

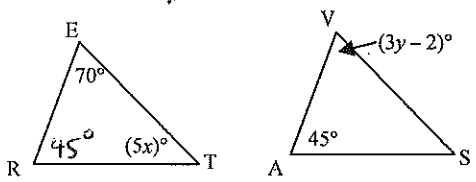
$\overline{ME} \cong \overline{GR}$
$\overline{EH} \cong \overline{RA}$
$\overline{HS} \cong \overline{AD}$
$\overline{MS} \cong \overline{GD}$

and

Congruent Angles

$\angle M \cong \angle G$
$\angle E \cong \angle R$
$\angle H \cong \angle A$
$\angle S \cong \angle D$

6. Given: $\Delta RET \cong \Delta AVS$. Find *x* and *y*.



By CPCTC, $\angle E \cong \angle V$

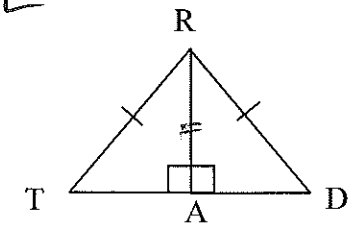
$\therefore 70 = 3y - 2$
$+2 \quad +2$
$\frac{72}{3} = \frac{3y}{3}$
$y = 24$

$180 - 70 - 45 = 65$
$\therefore \angle T = 65°$
$\therefore \frac{5x}{5} = \frac{65}{5}$
$x = 13$

For Problems 7 –18, complete the triangle congruence statement and select the postulate used. If not possible, select "Not possible".

7. Postulate (reason)

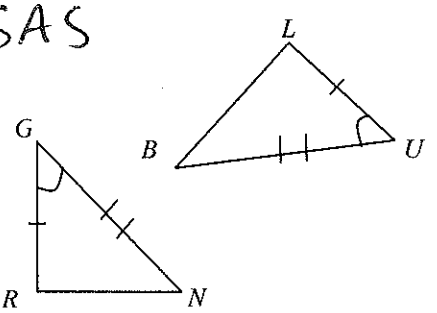
HL



8. $\Delta ART \cong$ ΔARD

9. Postulate (reason)

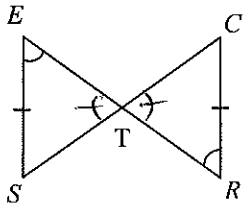
SAS



10. $\Delta GRN \cong$ ΔULB

11. Postulate (reason)

AAS

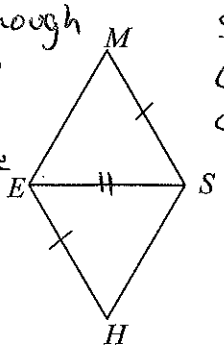


12. $\Delta SET \cong$ ΔCRT

13. Postulate (reason)

Not enough info

$\therefore$ Not possible

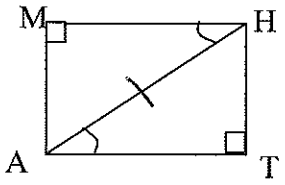


14. $\Delta MES \cong$ Not possible

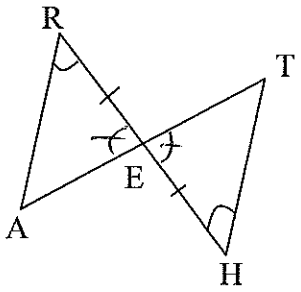
Since not $\cong$, can't write congruence statement

15. Postulate (reason) **16.** ΔMAH ≅ ΔTHA **17.** Postulate (reason) **18.** ΔARE ≅ ΔTHE

AAS



ASA

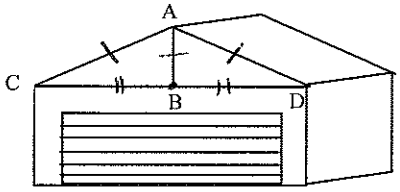


19. In the truss of the roof in the diagram below, $\overline{AC} \cong \overline{AD}$ and B is the midpoint of $\overline{CD}$. Explain why the triangles, ΔABC and ΔABD, are congruent.

B mid $\overline{CD}$ ⇒ $\overline{CB} \cong \overline{DB}$

$\overline{AB} \cong \overline{AB}$ by reflexive prop. of segments.

Why? SSS!



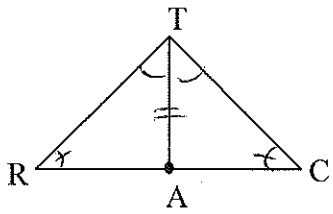
In the diagram below, ∠RTA ≅ ∠CTA and ∠R ≅ ∠C are given.

20. What other piece of information can you conclude from the diagram? (Without inferring triangle congruence)

$\overline{TA} \cong \overline{TA}$ by reflexive prop. of segments

21. Explain why ΔRTA ≅ ΔCTA.

Why? AAS!



22. How would you prove $\overline{RT} \cong \overline{TC}$?

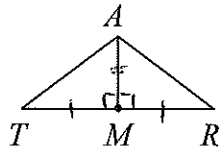
How? CPCTC!

Complete the proof by filling the missing statement or reason in the blank.

Given: $\overline{AM} \perp \overline{TR}$

$\overline{TM} \cong \overline{RM}$

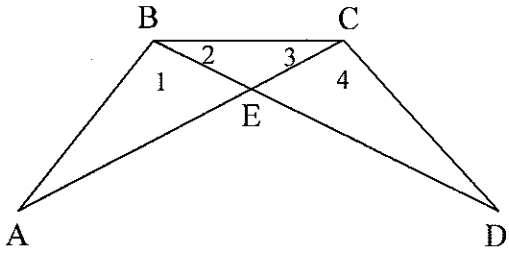
Prove: ∠TAM ≅ ∠RAM



STATEMENTS	REASONS
23. $\overline{AM} \perp \overline{TR}$	Given
$\overline{TM} \cong \overline{RM}$	**24.** Given
∠AMR & ∠AMT are right ∠s	**25.** If 2 seg ⊥, then rt. ∠s
∠AMR ≅ ∠AMT	**26.** If 2 ∠'s are rt., then ≅
27. $\overline{AM} \cong \overline{AM}$	Reflexive Property
28. ΔATM ≅ ΔARM	**29.** SAS
∠TAM ≅ ∠RAM	**30.** CPCTC

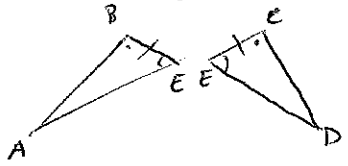
Use diagram 1 for #31-33.

Diagram 1



31. If ΔBEC is isosceles with base BC, which of the following must be given in order to prove $\Delta BAE \cong \Delta CDE$ by ASA?

A. $\angle 2 \cong \angle 3$
B. $\overline{AB} \cong \overline{CD}$
C. $\overline{AE} \cong \overline{ED}$
D. $\angle 1 \cong \angle 4$



32. You are given $\overline{AB} \cong \overline{CD}$ and $\overline{AC} \cong \overline{BD}$. In order to prove the pair of overlapping triangles congruent, what additional fact must we use?

A. Vertical angles are congruent.
B. The reflexive property of segments
C. The addition property of segments
D. If ☆, then △.

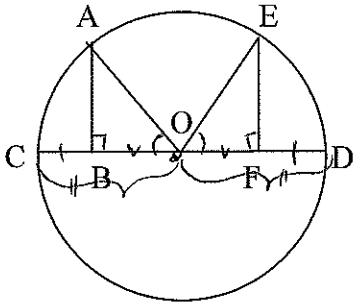
33. Given $\overline{AE} \cong \overline{ED}$ and $\overline{BE} \cong \overline{CE}$, what additional given is required in order to prove $\Delta ABE \cong \Delta DCE$ by HL?

A. $\angle 1 \cong \angle 4$
B. $\overline{AB} \cong \overline{CD}$
C. $\angle 1$ and $\angle 4$ are right angles.
D. $\overline{BD} \perp \overline{AC}$

34. Write a two column proof.

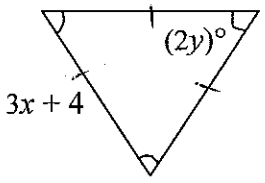
Given: Circle O
$\overline{BC} \cong \overline{FD}$
$\overline{EF} \perp \overline{CD}$
$\overline{AB} \perp \overline{CD}$
$\angle BOA \cong \angle FOE$

Prove: $\overline{AB} \cong \overline{EF}$



STATEMENTS	REASONS
① ⊙O $\overline{BC} \cong \overline{FD}$ $\overline{EF} \perp \overline{CD}$, $\overline{AB} \perp \overline{CD}$ $\angle BOA \cong \angle FOE$	① Given
② $\angle ABO$, $\angle EFO$ rt.	② If seg ⊥, then rt. $\angle$s
③ $\angle ABO \cong \angle EFO$	③ Rt. $\angle$s $\cong$.
④ $\overline{CO} \cong \overline{DO}$	④ All radii are $\cong$
⑤ $\overline{BO} \cong \overline{FO}$	⑤ Subtraction prop. of segments
⑥ $\Delta ABO \cong \Delta EFO$	⑥ ASA
⑦ $\overline{AB} \cong \overline{EF}$	⑦ CPCTC

35. The perimeter of the triangle is 120. Find the value of x and y.



Equiangular △ ⇒ Equilateral △

$3x+4 + 3x+4 + 3x+4 = 120$

$9x + 12 = 120$

$9x = 108$

$\frac{9x}{9} = \frac{108}{9}$

$x = 12$

Each $\angle$ in an equiangular △ has a measure of 60°.

$\therefore \frac{2y}{2} = \frac{60}{2}$

$y = 30$

Another method

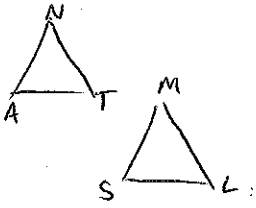
or $2y + 2y + 2y = 180$

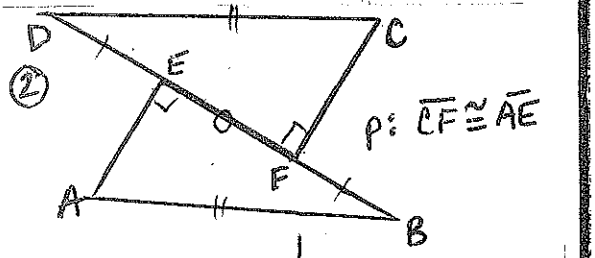
$6y = 180 \Rightarrow y = 30$

H. Geo Unit 3 Name Key

① If $\triangle ANT \cong \triangle SML$, which of the following is not necessarily true? (Draw a diagram)

a) $\angle T \cong \angle L$
b) $\overline{AT} \cong \overline{SL}$
c) $\angle M \cong \angle N$
d) $\overline{TN} \cong \overline{LS}$



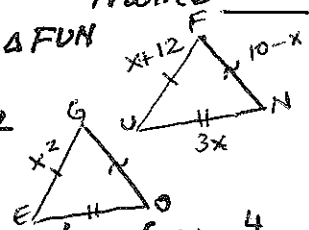
② 

p: $\overline{CF} \cong \overline{AE}$

STATEMENTS	REASONS
1. $\overline{AE} \perp \overline{DB}$, $\overline{CF} \perp \overline{DB}$, $\overline{DE} \cong \overline{BF}$, $\overline{DC} \cong \overline{BA}$	1. Given
2. $\angle AEB$, $\angle CFD$ rt. $\angle$	2. If seg $\perp$, then rt. $\angle$s
3. $\overline{EF} \cong \overline{EF}$	3. Reflexive prop. of segments
4. $\overline{EB} \cong \overline{FD}$	4. Addition prop. of segments
5. $\triangle EAB \cong \triangle FCD$	5. HL
6. $\overline{CF} \cong \overline{AE}$	6. CPCTC

⑯ Given: $\triangle GEO \cong \triangle FUN$

$GE = x^2$
$UF = x+12$
$UN = 3x$
$FN = 10-x$



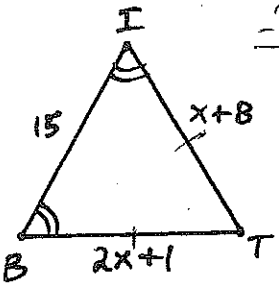
$x^2 = x+12$
$-x \quad -12 \quad -x \quad -12$
$x^2 - x - 12 = 0$
$(x-4)(x+3) = 0$
$x-4=0$ or $x+3=0$
$x=4$ or $x=-3$

Can't have negative length ↓
$3(-3) = -9$

Find { all possible values of x: 4
the perimeter of $\triangle GEO$: $6+12+16 = 34$

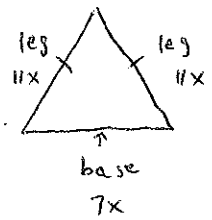
$FN = 10-(4) = 6$, $UN = 3(4) = 12$, $FU = (4)+12 = 16$

⑰ Solve for x



$x+8 = 2x+1$
$-x \quad -x$
$8 = x+1$
$-1 \quad -1$
$7 = x$

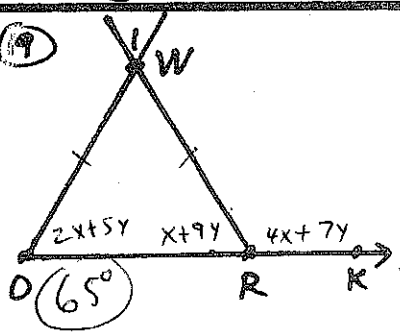
⑱ The lengths of a base and leg of an isosceles triangle are in a ratio of 7:11. If the perimeter is 87, find the length of the base.



$11x + 11x + 7x = 87$
$29x = 87$
$29 \quad 29$
$x = 3$

Base $= 7x = 7(3) = 21$

⑲



Given: $\overline{OW} \cong \overline{RW}$

$m\angle O = 2x+5y$
$m\angle WRO = x+9y$
$m\angle WRK = 4x+7y$

Find: $m\angle O = 65°$

$2x+5y = x+9y$
$-x \quad -9y \quad -x \quad -9y$
$x - 4y = 0$

① $2x+5y = x+9y$
② $x+9y+4x+7y = 180$

Rewritten:
① $x-4y=0$
② $5x+16y=180$

mult top eq by 4 to eliminate y.

$4(x-4y=0)$
$4x-16y=0$

$4x-16y=0$
$5x+16y=180$
$9x = 180 \Rightarrow x = 20$

$\therefore m\angle O = 2x+5y = 2(20)+5(5) = 65$

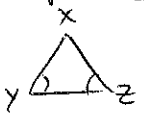
$x-4y=0$
$20-4y=0$
$-20 \quad -20$
$\frac{-4y}{-4} = \frac{-20}{-4}$
$y = 5$

Write { A for Always (true), S for Sometimes (true), N for Never (true) ← { draw a diagram, consider all possibilities

③ Two triangles are congruent if 2 sides and one angle are congruent to the corresponding parts of another. (S)

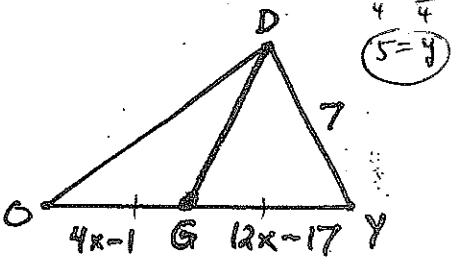
④ An acute scalene triangle is congruent to an obtuse isosceles triangle. (N)

⑤ If $\angle Y \cong \angle Z$ in $\triangle XYZ$, then $\overline{XZ} \cong \overline{ZY}$. (S)



only if.. $\angle X \cong \angle Y \cong Z$

⑩

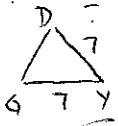


$\overline{DG}$ is a median of $\triangle DOY$. Is $\triangle DGY$ isosceles?

SHOW WORK

$4x-1 = 12x-17$
$-4x \quad -4x$
$-1 = 8x-17$
$+17 \quad +17$
$\frac{16}{8} = \frac{8x}{8}$
$2 = x$

$GY = 12x-17$
$= 12(2)-17$
$= 24-17$
$= 7$



$\Rightarrow 2 \cong$ sides

Yes, $\triangle DGY$ isosceles!