☑ Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Congruent Triangles & CPCTC Proofs		29, 30	1 - 4
Arc & Tic Marks	5 - 10		1 - 4
Triangle Congruence Theorems	5 – 10, 34	11 – 16, 29, 30	1 - 4
Solving Congruent Triangles		17, 18	
Isosceles & Equilateral Triangles	19 - 22		
Perimeter	19		
Classifying Triangles by Sides & Angles	32	23, 25 - 28	
Remote Exterior Angles Theorem		31	
Triangle Sum Theorem			
Coordinate Proofs		33	
Congruent Triangle Constructions	34		

I. Two-Column Proofs: Statements and Reasons all numbers. Correct notation too.

1. Given: $\overline{OG} \perp \overline{GE}$; $\overline{UR} \perp \overline{RL}$; $\overline{GE} \cong \overline{RU}$; $\overline{OE} \cong \overline{LU}$
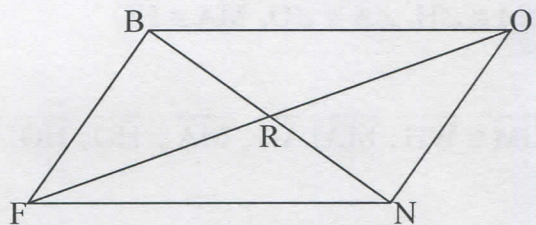
   Prove: $\overline{OG} \cong \overline{RL}$

   green
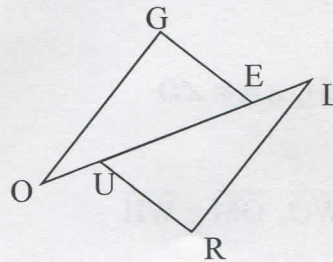
2. Given: $\overline{BF} \cong \overline{ON}$; $\overline{BF} \parallel \overline{ON}$

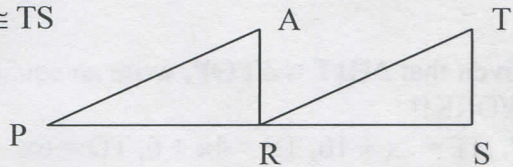   Prove: $\angle BOR \cong \angle NFR$

   lilac

3. Given: $\overline{AR} \perp \overline{RP}$; $\overline{TS} \perp \overline{SR}$; R is the midpoint of $\overline{PS}$; $\overline{AR} \cong \overline{TS}$

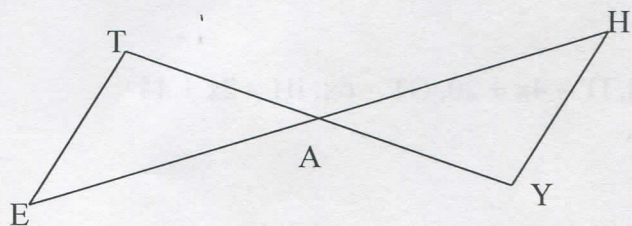   Prove: $\overline{PA} \parallel \overline{RT}$

   orange

4. Given: $\overline{ET} \parallel \overline{HY}$; $\overline{ET} \cong \overline{HY}$
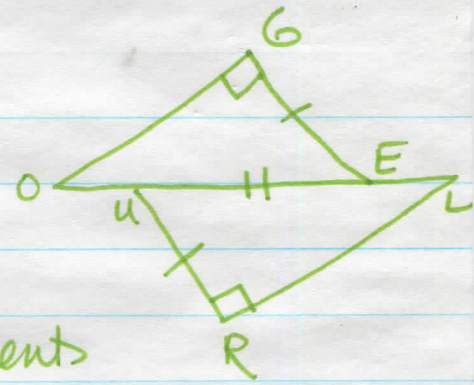
   Prove: A is the midpoint of $\overline{TY}$

   pink

1.

Statements	Reasons
1. $\overline{OG} \perp \overline{GE}$; $\overline{UR} \perp \overline{RL}$ $\overline{GE} \cong \overline{RU}$; $\overline{OE} \cong \overline{LU}$	1. Given
2. $\angle G$ & $\angle R$ are Rt $\angle$'s	2. Def of $\perp$ segments
3. $\angle G \cong \angle R$	3. Def of Rt $\angle$'s
4. $\triangle OGE \cong \triangle LRU$	4. HL $\cong$ Thm
5. $\overline{OG} \cong \overline{RL}$	5. CPCTC

2.

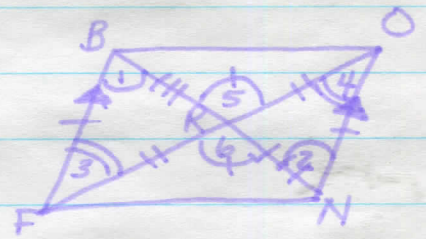| Statements	Reasons
1. $\overline{BF} \cong \overline{ON}$; $\overline{BF} \parallel \overline{ON}$	1. Given
2. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	2. If $\parallel \leftrightarrow$ ⇒ AIA R $\cong$ (AIA Thm)
3. $\triangle BFR \cong \triangle NOR$	3. ASA $\cong$ Thm
4. $\angle 5 \cong \angle 6$	4. Def of vertical $\angle$'s
5. $\overline{FR} \cong \overline{OR}$; $\overline{BR} \cong \overline{RN}$	5. CPCTC
6. $\triangle BOR \cong \triangle NFR$	6. SAS $\cong$ Thm
7. $\angle BOR \cong \angle NFR$	7. CPCTC

3.

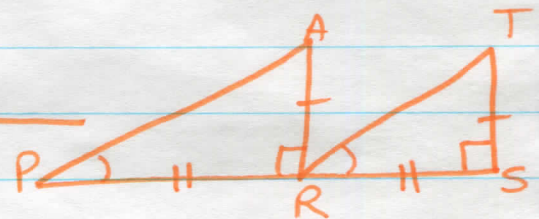| Statements	Reasons
1. $\overline{AR} \perp \overline{RP}$; $\overline{TS} \perp \overline{SR}$; R is the mdpt of $\overline{PS}$; $\overline{AR} \cong \overline{TS}$	1. Given
2. $\angle ARP$ & $\angle TSR$ R Rt $\angle$'s	2. Def of $\perp$ segment
3. $\angle ARP \cong \angle TSR$	3. Def of Rt $\angle$'s
4. $\overline{PR} \cong \overline{RS}$	4. Def of mdpt
5. $\triangle PAR \cong \triangle RTS$	5. SAS $\cong$ Thm
6. $\angle P \cong \angle TRS$	6. CPCTC
7. $\overline{PA} \parallel \overline{RT}$	7. If corr $\angle$'s R $\cong$ ⇒ $\leftrightarrow$ R $\parallel$.

4. Statement	Reasons
1. $\overline{ET} \parallel \overline{HY}$; $\overline{ET} \cong \overline{HY}$	1. Given
2. $\angle 1 \cong \angle 2$	2. Def of vertical $\angle$s
3. $\angle 3 \cong \angle 4$	3. AIA Thm
4. $\triangle EAT \cong \triangle HAY$	4. AAS $\cong$ Thm
5. $\overline{TA} \cong \overline{AY}$	5. CPCTC
6. A is the mdpt of $\overline{TY}$	6. Def of mdpt

II. Name the congruence theorem that justifies the following pairs of triangles are congruent. If there is not enough information, write none. Be sure to mark all missing information you used properly.
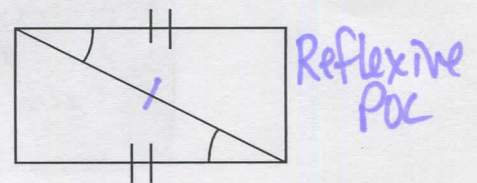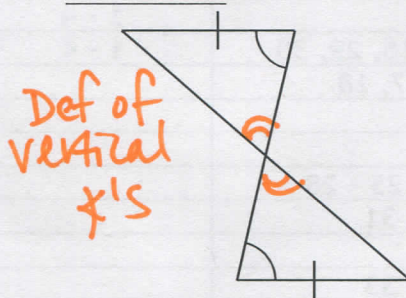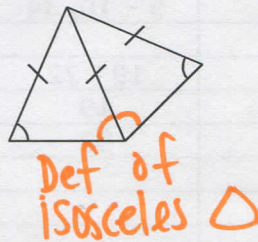
5. _none_

AAA

6. _SSS_

Reflexive POC

7. _SAS_

Reflexive POC

8. _AAS or SAA_

Def of vertical ∡'s

9. _AAS or SAA_

Def of isosceles △

10. _SSS_

Reflexive POC
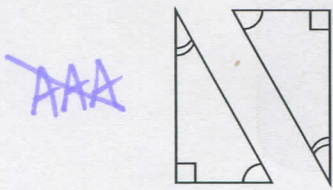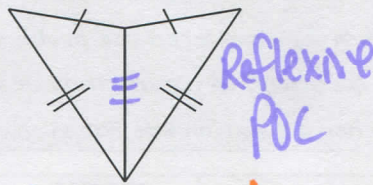
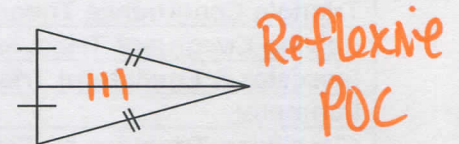**III. Write the congruent statements and how the triangles are congruent, if they are congruent.**

11. $\angle G \cong \angle W$, $\overline{MA} \cong \overline{HO}$, $\angle M \cong \angle H$

AAS or SAA

12. $\angle G \cong \angle W$, $\angle M \cong \angle H$, $\angle A \cong \angle O$

none   ~~AAA~~

13. $\overline{MA} \cong \overline{HO}$, $\overline{GA} \cong \overline{WO}$, $\overline{GM} \cong \overline{WH}$

SSS

14. $\angle M \cong \angle H$, $\angle A \cong \angle O$, $\overline{MA} \cong \overline{HO}$
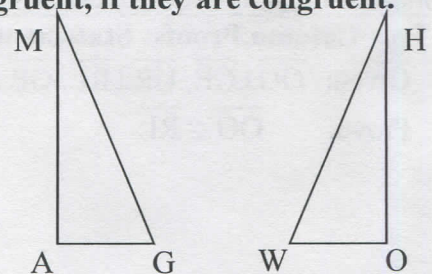
ASA

15. $\overline{GM} \cong \overline{WH}$, $\overline{MA} \perp \overline{AG}$, $\overline{MA} \cong \overline{HO}$, $\overline{HO} \perp \overline{WO}$

HL

16. $\angle A \cong \angle O$, $\overline{MA} \cong \overline{HO}$, $\overline{GA} \cong \overline{WO}$
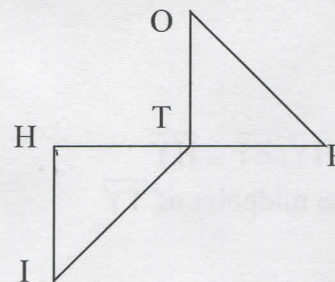
SAS

$\triangle MAG \cong \triangle HOW$

IV. Given that ΔHIT ≅ ΔTOP, write an equation and solve for x in each of the following. SHOW YOUR WORK!!

17. HT = 2x + 10, TP = 4x + 6, TO = 6x − 6

X = 2

18. IT = 4x + 20, OT = 6x, IH = 2x + 44

X = 11

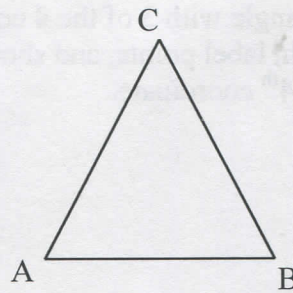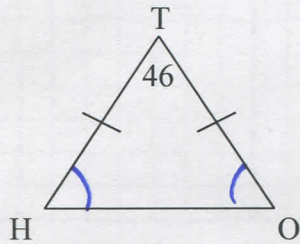**V. Short Answer.**

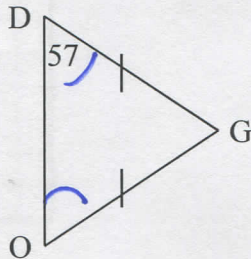19. $m\angle A = m\angle B$, $AB = 5x + 9$, $BC = 3x + 15$ and $AC = 7x - 35$

$x =$ _____ **12.5** _____

AB = _____ **71.5** _____ Perimeter = _____ **176.5** _____

20. $m\angle H =$ _____ **67°** _____

21. $m\angle G =$ _____ **66°** _____

22. $m\angle OLE =$ _____ **120.5°** _____
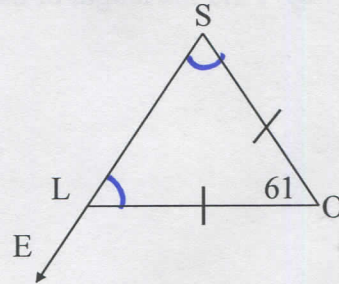
VI. Always (A), Sometimes (S) or Never (N):

23. **A** An equiangular triangle is isosceles, equilateral and acute.

24. **S** A scalene triangle is a right triangle.

25. **A** The sum of the measures of the exterior angles of a triangle is 360 degrees.

26. **A** An equilateral triangle is isosceles.

27. **N** An isosceles triangle is scalene.

28. **N** An equilateral triangle is a right triangle.

29. **S** CPCTC is used after triangles are congruent.

30. **N** CPCTC stands for corresponding parts of congruent triangles are corresponding.

VII. Free Response

31. Find the value(s) of x

$$X = 4 \pm 2\sqrt{14}$$

(triangle with angles $3x^2$, $-24x$, $120°$)
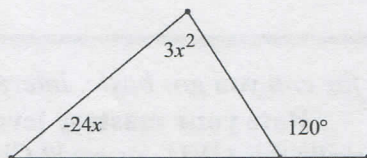
32. An equilateral triangle has an angle measure of $x^2 + 20$ and a side length of $2x^2$. Find the length of one side.
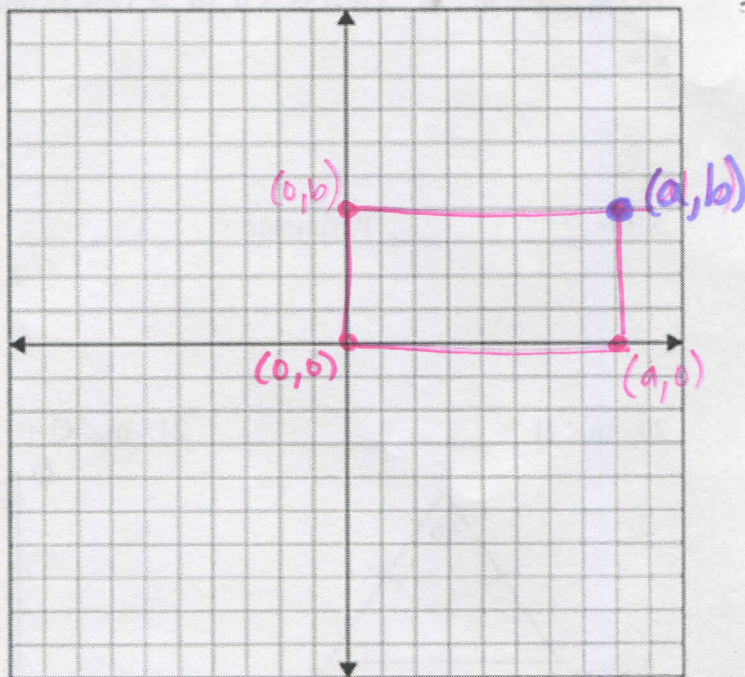
$$X = \pm 2\sqrt{10}$$

33. Given a rectangle with 3 of the 4 coordinates $(0, 0)$ $(a, 0)$ and $(0, b)$.
Draw a graph, label points, and show all work!!!!!
a) Find the 4th coordinate.

(a, b)

b) Find the length of the diagonal.

$$\sqrt{a^2 + b^2}$$

Graph with points labeled $(0, b)$, (a, b), $(0, 0)$, $(a, 0)$ forming a rectangle.

34. List and explain all the ways to prove triangles congruent as well as all the ways that DO NOT work.
You need to know how to CONSTRUCT congruent Triangles with protractor, ruler, & compass.

~~SSA~~ ~~AAA~~ SSS SAS ASA HL AAS/SAA