


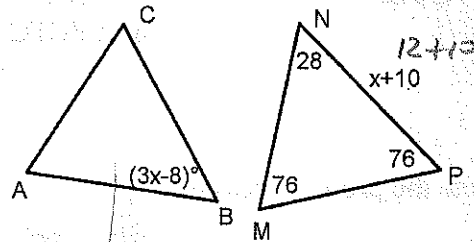
In problems 1-8, decide if each statement is Always true (A), Sometimes true (S) or Never true (N).

- An acute triangle has only one acute angle. N
- If a triangle is scalene, then it is also an obtuse triangle. S 
- The altitude of a triangle bisects the side to which it is drawn. S
- An altitude of a triangle connects to its opposite side at a point 'inside' the triangle. S
- A median of a triangle connects to its opposite side at a point 'inside' the triangle. A
- If a triangle is isosceles, its base angles are congruent. A
- In a scalene triangle, the smallest angle is opposite the largest side. N
- The base of an isosceles triangle is drawn at the bottom of the diagram. S

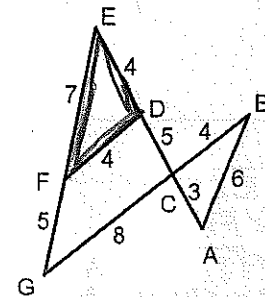
9. Given  $\triangle ABC \cong \triangle MNP$

- Solve for x: 12
- Find NP: 22
- Are these triangles equilateral, isosceles, or scalene? isosceles

$$\begin{array}{r} 3x - 8 = 28 \\ + 8 \quad + 8 \\ \hline 3x = 36 \\ x = 12 \end{array}$$

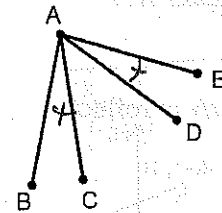


10. In the diagram on the right, find an isosceles triangle, and name the base angles of this triangle:  $\angle FED, \angle EFD$



11. In the diagram on the right, if  $\angle BAC \cong \angle EAD$  then what property justifies that  $\angle BAD \cong \angle EAC$ ?

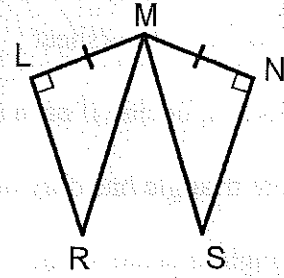
Addition Property



12. In a triangle, what name is given to a line segment drawn from a vertex to the opposite side if the line segment is perpendicular to the opposite side?

altitude

13. In the diagram, if  $\overline{LM} \cong \overline{NM}$ :



(a) In order to prove  $\triangle MLR \cong \triangle MNS$  by SAS, what additional two sides must be congruent?

$\overline{LR}$  and  $\overline{NS}$

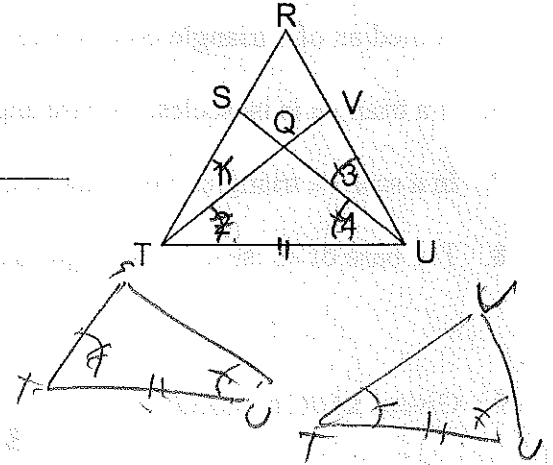
(b) In order to prove  $\triangle MLR \cong \triangle MNS$  by HL, what additional two sides must be congruent?

$\overline{MR}$  and  $\overline{MS}$

14. Complete the proof: Given:  $\angle 1 \cong \angle 3$

$\angle 2 \cong \angle 4$

Prove:  $\overline{ST} \cong \overline{VU}$



Statement

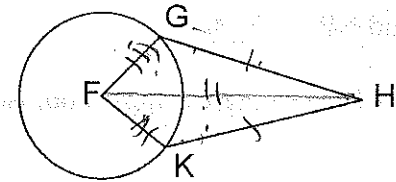
Reason

- |  |                       |
|--|-----------------------|
| 1. $\angle 1 \cong \angle 3$ ,         | 1. Given              |
| 2. $\angle 2 \cong \angle 4$           | 2. Given              |
| 3. $\angle STU \cong \angle VUT$       | 3. Addition Property  |
| 4. $\overline{TU} \cong \overline{TU}$ | 4. Reflexive Property |
| 5. $\triangle STU \cong \triangle VUT$ | 5. ASA                |
| 6. $\overline{ST} \cong \overline{VU}$ | 6. CPCTC              |

15. Complete the proof: Given:  $\odot F$

$\overline{GH} \cong \overline{KH}$

Prove:  $\angle FGH \cong \angle FKH$



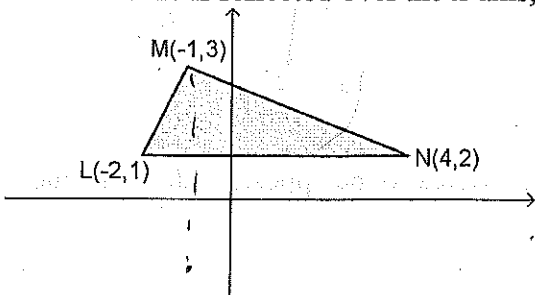
Statement

Reason

- |  |                       |
|--|-----------------------|
| 1. $\odot F$                           | 1. Given              |
| 2. $\overline{GH} \cong \overline{KH}$ | 2. Given              |
| 3. $\overline{FG} \cong \overline{FK}$ | 3. radii $\cong$      |
| 4. $\overline{FH} \cong \overline{FH}$ | 4. Reflexive Property |
| 5. $\triangle FGH \cong \triangle FKH$ | 5. SSS                |
| 6. $\angle FGH \cong \angle FKH$       | 6. CPCTC              |

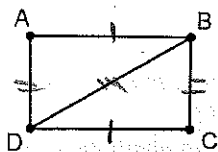
16. If  $\triangle LMN$  is reflected over the x-axis, write the coordinates of point  $M'$ :

$(-1, -3)$



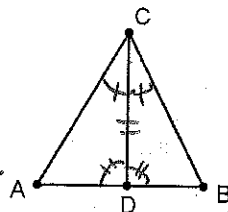
In problems 17-20, mark the diagrams with the given information, and then state the reason for the congruence (SSS, SAS, ASA or HL).

17.  $\overline{AB} \cong \overline{CD}$ ,  $\overline{BC} \cong \overline{DA}$



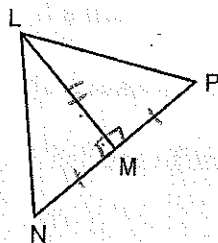
SSS

18.  $\angle ACD \cong \angle BCD$ ,  $\angle CDA \cong \angle CDB$



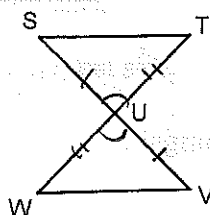
ASA

19.  $\overline{LM}$  is a median and an altitude,



SAS

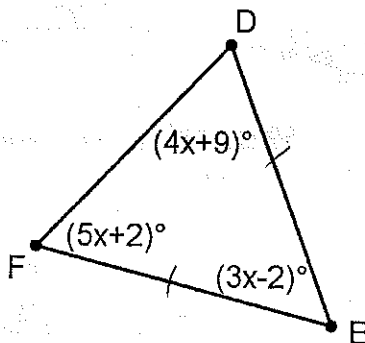
20. U is the midpoint of  $\overline{SV}$  and  $\overline{WT}$



SAS

21. If  $\overline{DE} \cong \overline{FE}$ , find x: 7

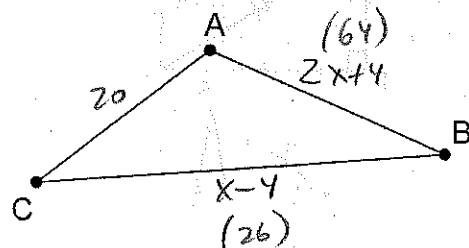
$$\begin{aligned} \angle F &\cong \angle D \\ 5x+2 &= 4x+9 \\ -4x &\quad -4x \\ \hline x+2 &= 9 \\ -2 &\quad -2 \\ \hline x &= 7 \end{aligned}$$



22. The perimeter of  $\triangle ABC$  is 110.  
 $AB = 2x+4$ ,  $BC = x-4$  and  $AC = 20$

(a) Find x: 30

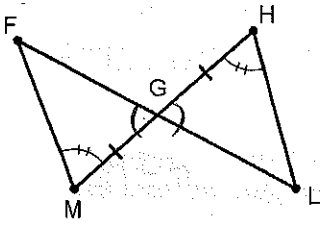
(b) Is this triangle scalene, isosceles, or equilateral? Scalene



$$\begin{aligned} 20 + 2x+4 + x-4 &= 110 \\ 3x + 20 &= 110 \\ -20 &\quad -20 \\ \hline 3x &= 90 \\ x &= 30 \end{aligned}$$

In problems 23-26, name the triangles that are congruent, and give the appropriate congruence theorem (SSS, SAS, ASA, or HL).

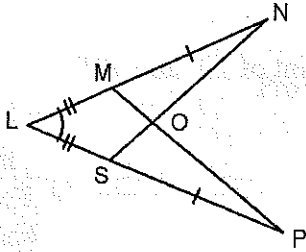
23.



$$\triangle FGM \cong \triangle LGH$$

$$\underline{\text{ASA}}$$

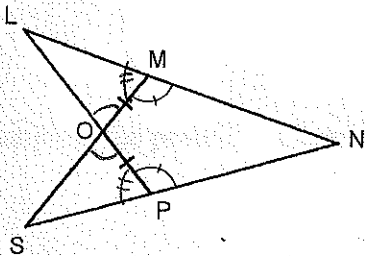
24.



$$\triangle LMP \cong \triangle LSN$$

$$\underline{\text{SAS}}$$

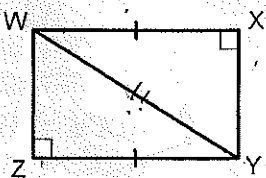
25.



$$\triangle LOM \cong \triangle SOP$$

$$\underline{\text{ASA}}$$

26.



$$\triangle WYZ \cong \triangle YWX$$

$$\underline{\text{HL}}$$

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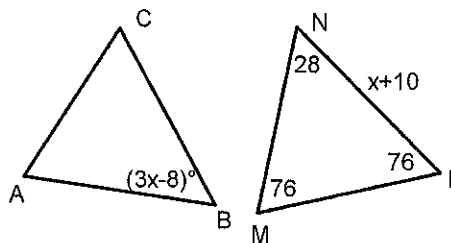
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2. If a triangle is scalene, then it is also an obtuse triangle. \_\_\_\_\_
3. The altitude of a triangle bisects the side to which it is drawn. \_\_\_\_\_
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7. In a scalene triangle, the smallest angle is opposite the largest side. \_\_\_\_\_
8. The base of an isosceles triangle is drawn at the bottom of the diagram. \_\_\_\_\_

9. Given  $\triangle ABC \cong \triangle MNP$

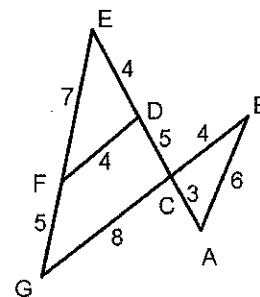
(a) Solve for x: \_\_\_\_\_

(b) Find NP: \_\_\_\_\_

(c) Are these triangles equilateral, isosceles, or scalene? \_\_\_\_\_

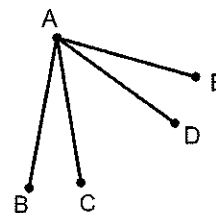


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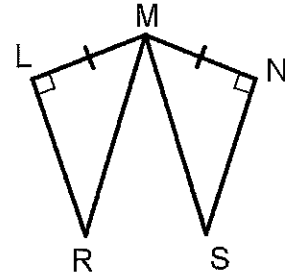
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13. In the diagram, if  $\overline{LM} \cong \overline{NM}$  :

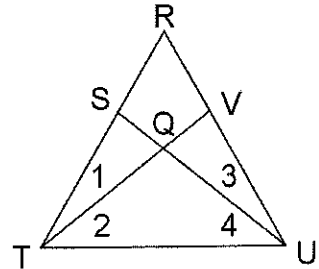
(a) In order to prove  $\triangle MLR \cong \triangle MNS$  by SAS, what additional two sides must be congruent?  
 \_\_\_\_\_ and \_\_\_\_\_

(b) In order to prove  $\triangle MLR \cong \triangle MNS$  by HL, what additional two sides must be congruent?  
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14. Complete the proof: Given:  $\angle 1 \cong \angle 3$   
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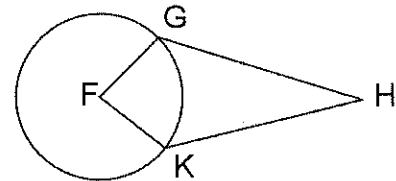
Prove:  $\overline{ST} \cong \overline{VU}$



Statement	Reason
1. $\angle 1 \cong \angle 3$ ,	1.
2. $\angle 2 \cong \angle 4$	2.
3.	3.
4.	4.
5.	5. ASA
6. $\overline{ST} \cong \overline{VU}$	6. CPCTC

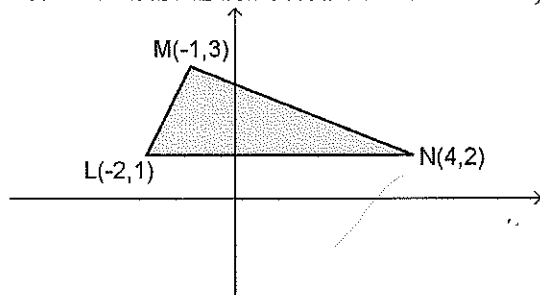
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Prove:  $\angle FGH \cong \angle FKH$



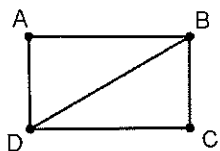
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1. $\odot F$	1. Given
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4.	4.
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16. If  $\triangle LMN$  is reflected over the x-axis, write the coordinates of point  $M'$  : \_\_\_\_\_



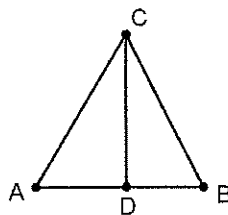
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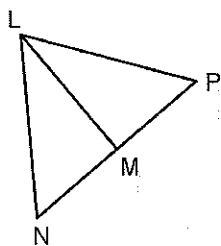
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18.  $\angle ACD \cong \angle BCD$ ,  $\angle CDA \cong \angle CDB$



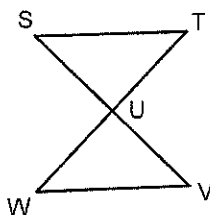
\_\_\_\_\_

19.  $\overline{LM}$  is a median and an altitude,



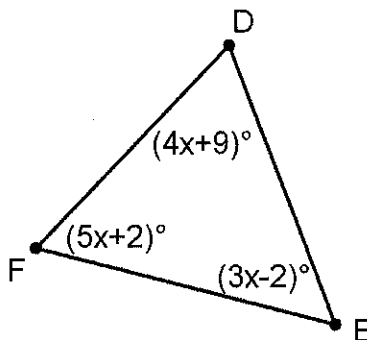
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\_\_\_\_\_

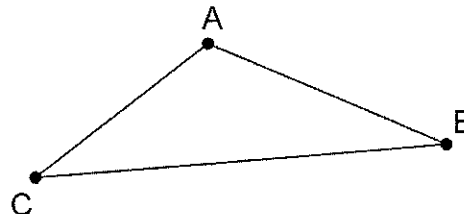
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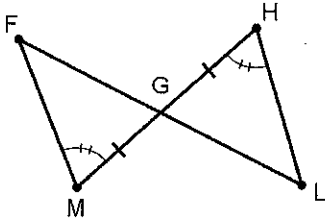
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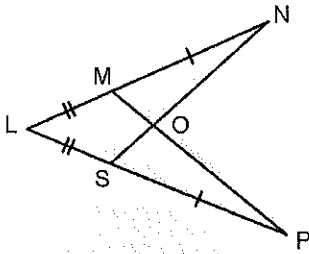
23.



$\triangle FGM \cong$  \_\_\_\_\_

\_\_\_\_\_

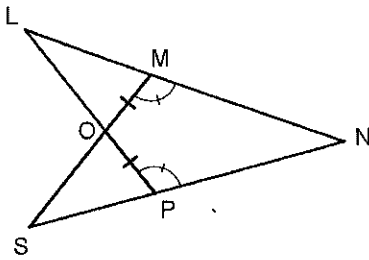
24.



$\triangle LMP \cong$  \_\_\_\_\_

\_\_\_\_\_

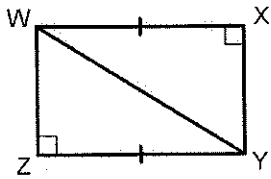
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$\triangle WYZ \cong$  \_\_\_\_\_

\_\_\_\_\_