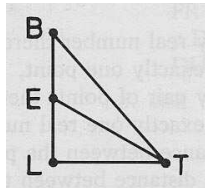


Math 119 – Plane Geometry

Review
7/21/2004

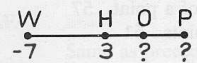
Line Segments

- In the figure, point E is between points B and L.
 - Write the equation that follows from this fact.
- In the figure, point E is the midpoint of \overline{BL} .
 - Write an equation relating BE and EL.
 - Write an equation relating EL and BL.

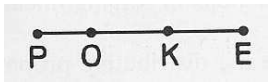


Line Segments

- H is the midpoint of \overline{WP} and O is the midpoint of \overline{HP} . The numbers are coordinates on a number line. Find the coordinate of P.



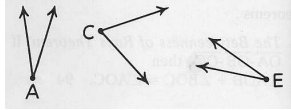
- *Given:* K is the midpoint of \overline{OE} .
 ► *Prove:* $PK = PE - OK$



Angles

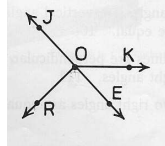
► True or False. Two angles are complementary if, and only if, their measures are 90.

► $\angle A$ is the complement of $\angle C$, and $\angle C$ is the complement of $\angle E$. Also $m\angle A = (x+30)$ and $m\angle E = (9 - 6x)$. Find $m\angle C$.



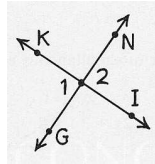
Angles

► \overline{JE} is a line; $m\angle JOR = m\angle ROE$.
 ▪ True or false: $\overline{OR} \perp \overline{OE}$.



► Given:
 ▪ $\angle 1$ and $\angle 2$ are vertical angles
 ▪ $\angle 1$ and $\angle 2$ are supplementary.

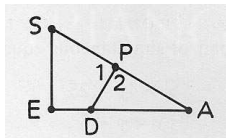
► Prove:
 ▪ $\overline{KI} \perp \overline{NG}$



Angles

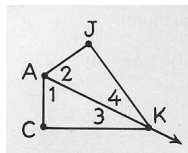
► Given:
 ▪ $\angle 1$ and $\angle 2$ are adjacent
 ▪ $m\angle 1 = m\angle E$ and $m\angle E = m\angle 2$

► Prove:
 ▪ $\overline{SA} \perp \overline{PD}$



► Given:
 ▪ \overline{AK} bisects $\angle JAC$
 ▪ $\angle 1$ and $\angle 3$ are complementary

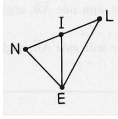
► Prove:
 ▪ $m\angle 2 = 90 - m\angle 3$



Triangles

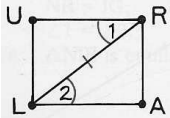
► $m\angle N = m\angle NEL$

- Which triangle in the figure must be isosceles? Why?



► $m\angle 1 = m\angle 2$

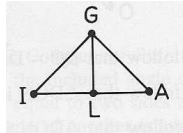
- If you knew that $m\angle U = m\angle A$, could you prove the triangles congruent by the ASA postulate? Why or why not?



Triangles

► Given:

- L is the midpoint of \overline{IA} ;
- $\overline{IG} \cong \overline{AG}$

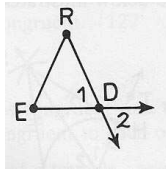


► Prove:

- $\triangle GIL \cong \triangle GAL$

► Given:

- $\overline{RE} \cong \overline{RD}$;
- $\angle 1$ and $\angle 2$ are vertical angles



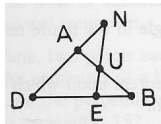
► Prove:

- $\angle E \cong \angle 2$

Triangles

► Given:

- $\overline{DN} \cong \overline{DB}$
- $\angle N \cong \angle B$

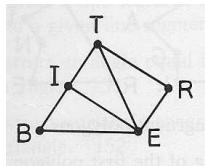


► Prove:

- $\overline{NE} \cong \overline{BA}$

► Given:

- $\triangle BIE \cong \triangle ERT$
- $\triangle TIE \cong \triangle ERT$
- $\angle BIE$ and $\angle TIE$ are adjacent



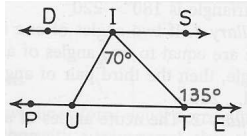
► Prove:

- $\overline{BT} \perp \overline{IE}$

Parallel

► $\overline{DS} \parallel \overline{PE}$. Find the measures of the following angles:

- $\angle SIT$
- $\angle IUT$
- $\angle PUI$

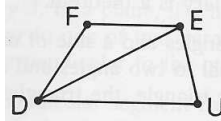


► **Given:**

- \overline{DE} bisects $\angle FDU$
- $DF \cong FE$

► **Prove:**

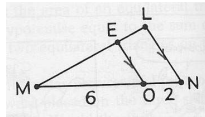
- $FE \parallel \overline{UD}$



Parallel

1. $\overline{EO} \parallel \overline{LN}$. Find the following:

- a) EO/LN .
- b) LE/EM

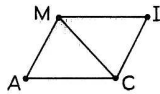


► **Given:**

- $\overline{MA} \cong \overline{IC}$
- $m\angle AMC = m\angle MCI$

► **Prove:**

- MICA is a parallelogram



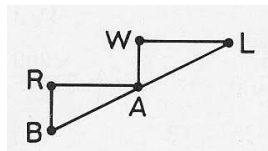
Parallel

► **Given:**

- Angles R and W are right angles
- $\overline{RA} \parallel \overline{WL}$ with transversal \overline{BL}
- $\overline{BA} \cong \overline{AL}$

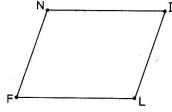
► **Prove:**

- Triangles ARB and LWA are congruent

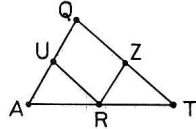


Quadrilaterals

- Given FILN is a parallelogram. What is $m\angle NFL + m\angle FLI$?

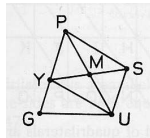


- **Given:**
- U, Z, and R are the midpoints of the sides of $\triangle QAT$
- **Prove:**
- QURZ is a parallelogram

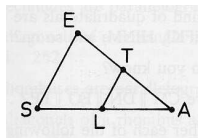


Quadrilaterals

- **Given:**
- In quadrilateral GPSU, \overline{PU} and \overline{YS} bisect each other
 - $\overline{PS} \cong \overline{GU}$
- **Prove:**
- $\overline{GU} \cong \overline{YU}$

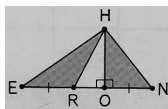


- **Given:**
- L is the midpoint of \overline{AS}
 - T is the midpoint of \overline{AE}
 - $m\angle TLA > m\angle A$
- **Prove:**
- $EA > ES$



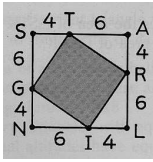
Area

- $\triangle JAY$ has sides of lengths 21, 29, and 20.
 - Is $\triangle JAY$ a right triangle?
 - Find the area of $\triangle JAY$.
- $\triangle OWL$ is a right triangle whose hypotenuse is 41 and one of whose legs is 9.
 - Find the length of its other leg.
 - Find the area of $\triangle OWL$.
- \overline{HO} is perpendicular to \overline{EN} ; $ER = ON$
 - Can you conclude that $\triangle HRE \cong \triangle HON$?
 - Can you conclude that the areas of $\triangle HRE$ and $\triangle HON$ are equal?

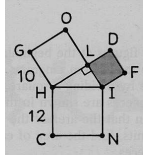


Areas

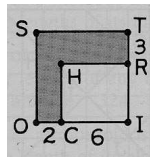
► Find the area of the shaded region.



► SALN is a square.



► Squares are drawn on the sides of a right triangle.

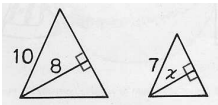


► OSTI is a square and CHRI is a rectangle.

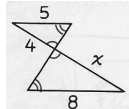
Similarity

► Find x .

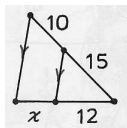
1)



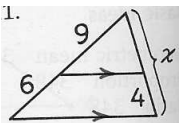
2)



3)



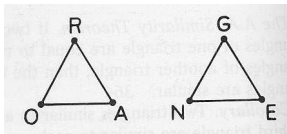
4) ^{1.}



Similarity

► Can you conclude that $\triangle ORA \sim \triangle NGE$ if you know that:

- Both triangles are equilateral?
- $RO = RA = GN = GE$?
- $m\angle R = m\angle G = 59$; $m\angle O = 60$, and $m\angle N = 61$?



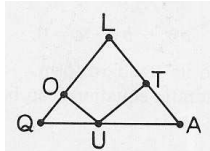
Similarity

► Given:

- Isosceles $\triangle LQA$ with $\overline{LQ} \cong \overline{LA}$
- $\overline{UO} \perp \overline{LQ}$
- $\overline{UT} \perp \overline{LA}$

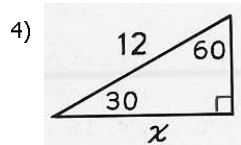
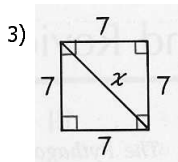
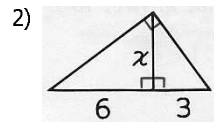
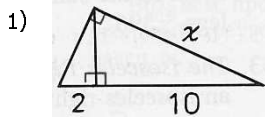
► Prove:

- $\triangle QOU \sim \triangle ATU$



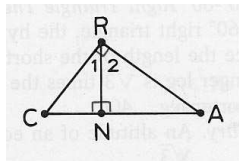
Right Triangles

► Find x.



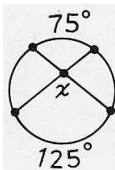
Right Triangles

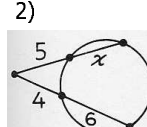
► Why is $m\angle 1 = m\angle A$?

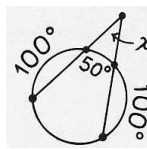



Circles

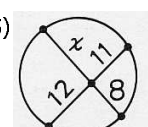
► Solve for x.

1) 

2) 

3) 

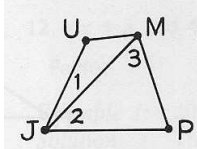
4) 

5) 

Inequalities

► Facts:

1. $m\angle U > m\angle UMP$
2. $m\angle P > m\angle UJP$
3. $m\angle UJP = m\angle 1 + m\angle 2$
4. $m\angle UJP > m\angle 3$



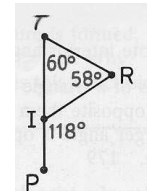
► Tell which fact (or facts) and which property of inequality can be used to prove:

- a) $m\angle U - m\angle UMP > 0$
- b) $m\angle P > m\angle 3$

Inequalities

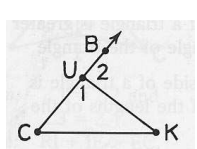
► RIP is an exterior angle of $\triangle TRI$.

- Which side of $\triangle TRI$ is the longest?



► **Given:**

- $m\angle 1 > m\angle 2$
- $\angle 2$ is an exterior angle of $\triangle UKC$



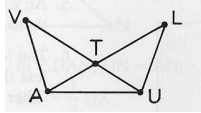
► **Prove:**

- $CK > UK$

Inequalities

► Given:

- $m\angle VAU = m\angle LUA$
- $m\angle VUA = m\angle LAU$

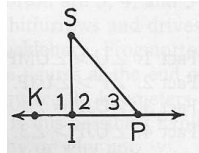


► Prove:

- $AV + AU > AL$

► Given:

- $\overline{SI} \perp \overline{KP}$
- $\angle 1$ is an exterior angle of $\triangle SIP$



► Prove:

- $\angle 3$ is acute
