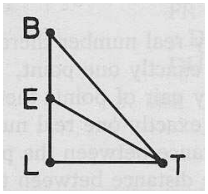
Math 119 – Plane Geometry

Review

7/21/2004

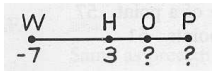
Line Segments

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

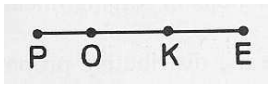


Line Segments

- 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.

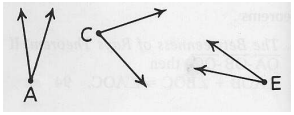


- *Given:* K is the midpoint of $\overline{OE}$.
- *Prove:* PK = PE - OK



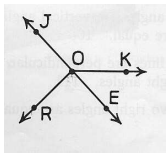
Angles

- True or False. Two angles are complementary if, and only if, their measures are 90.
- ∠A is the complement of ∠C, and ∠C is the complement of ∠E. Also m∠A = (x+30) and m∠E = (9 – 6x). Find m∠C.

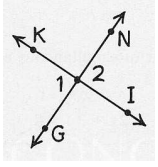


Angles

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

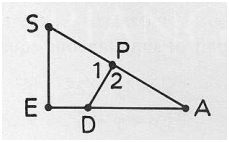


- *Given:*
  - ∠1 and ∠2 are vertical angles
  - ∠1 and ∠2 are supplementary.
- *Prove:*
  - $\overline{KI} \perp \overline{NG}$

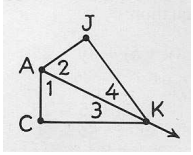


Angles

- *Given:*
  - ∠1 and ∠2 are adjacent
  - m∠1 = m∠E and m∠E = m∠2
- *Prove:*
  - $\overline{SA} \perp \overline{PD}$

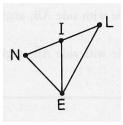


- *Given:*
  - $\overline{AK}$ bisects ∠JAC
  - ∠1 and ∠3 are complementary
- *Prove:*
  - m∠2 = 90 – m∠3

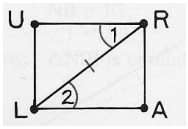


Triangles

- $m\angle N = m\angle NEL$
  - Which triangle in the figure must be isosceles? Why?

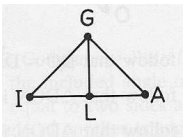


- $m\angle 1 = m\angle 2$
  - If you knew that $m\angle U = m\angle A$, could you prove the triangles congruent by the ASA postulate? Why or why not?

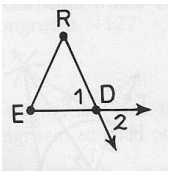


Triangles

- *Given:*
  - L is the midpoint of $\overline{IA}$;
  - $\overline{IG} \cong \overline{AG}$
- *Prove:*
  - $\Delta GIL \cong \Delta GAL$

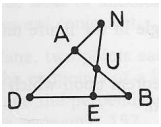


- *Given:*
  - $\overline{RE} \simeq \overline{RD}$;
  - $\angle 1$ and $\angle 2$ are vertical angles
- *Prove:*
  - $\angle E \simeq \angle 2$

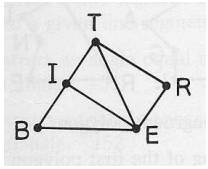


Triangles

- *Given:*
  - $\overline{DN} \cong \overline{DB}$
  - $\angle N \cong \angle B$
- *Prove:*
  - $\overline{NE} \cong \overline{BA}$

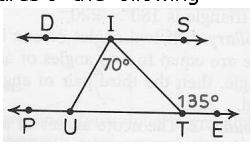


- *Given:*
  - $\Delta BIE \simeq \Delta ERT$
  - $\Delta TIE \simeq \Delta ERT$
  - $\angle BIE$ and $\angle TIE$ are adjacent
- *Prove:*
  - $\overline{BT} \perp \overline{IE}$

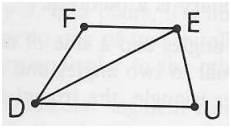


Parallel

- $\overline{DS} \parallel \overline{PE}$. Find the measures of the following angles:
  - $\angle SIT$
  - $\angle IUT$
  - $\angle$ PUI

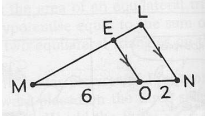


- *Given:*
  - $\overline{DE}$ bisects $\angle FDU$
  - $\overline{DF} \cong \overline{FE}$
- *Prove:*
  - $\overline{FE} \parallel \overline{UD}$

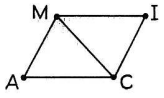


Parallel

1. $\overline{EO} \parallel \overline{LN}$. Find the following:
   a) EO/LN.
   b) LE/EM

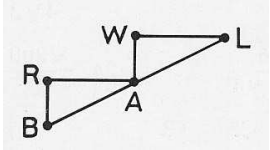


- *Given:*
  - $\overline{MA} \cong \overline{IC}$
  - $m\angle AMC = m\angle MCI$
- *Prove:*
  - MICA is a parallelogram



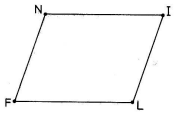
Parallel

- 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

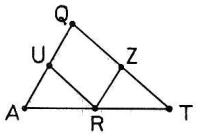


Quadrilaterals

- Given FILN is a parallelogram. What is m∠NFL + m∠FLI?

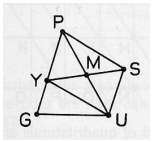


- *Given:*
  - U, Z, and R are the midpoints of the sides of ΔQAT
- *Prove:*
  - QURZ is a parallelogram

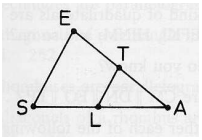


Quadrilaterals

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

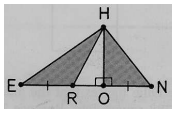


- *Given:*
  - L is the midpoint of $\overline{AS}$
  - T is the midpoint of $\overline{AE}$
  - m∠TLA > m∠A
- *Prove:*
  - EA > ES



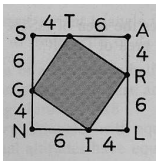
Area

1. ΔJAY has sides of lengths 21, 29, and 20.
   - Is ΔJAY a right triangle?
   - Find the area of ΔJAY.
2. ΔOWL 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 ΔOWL.
3. $\overline{HO}$ is perpendicular to $\overline{EN}$; ER = ON
   - Can you conclude that ΔHRE ≅ ΔHON?
   - Can you conclude that the areas of ΔHRE and ΔHON are equal?

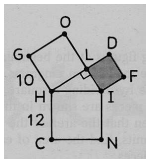


Areas

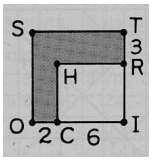
- Find the area of the shaded region.



- SALN is a square.



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

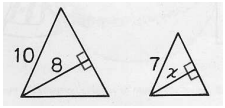


- OSTI is a square and CHRI is a rectangle.

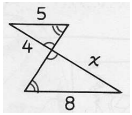
Similarity

- Find x.

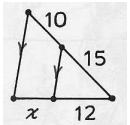
1)



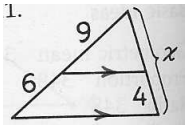
2)



3)

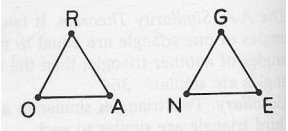


4)



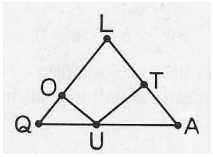
Similarity

- Can you conclude that ΔORA ~ ΔNGE if you know that:
  - Both triangles are equilateral?
  - RO = RA = GN = GE?
  - m∠R = m∠G = 59; m∠O = 60, and m∠N = 61?



Similarity

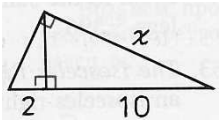
- Given:
  - Isosceles ΔLQA with $\overline{LQ} \cong \overline{LA}$
  - $\overline{UO} \perp \overline{LQ}$
  - $\overline{UT} \perp \overline{LA}$
- Prove:
  - ΔQOU ~ ΔATU



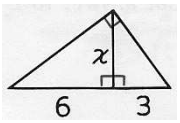
Right Triangles

- Find x.

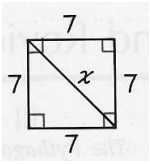
1)



2)



3)



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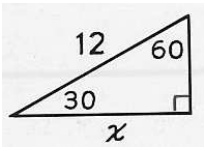
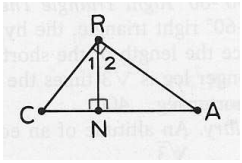


Right Triangles

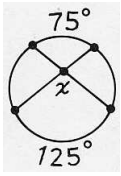
- Why is m∠1 = m∠A?



Circles

- Solve for x.

1)



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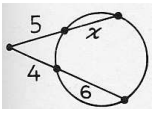

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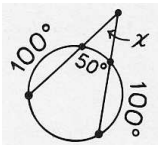

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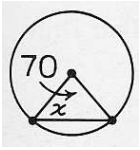

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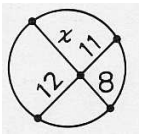
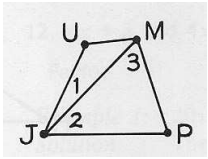


Inequalities

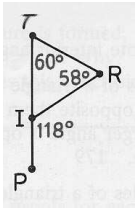
- Facts:
  1. m∠U > m∠UMP
  2. m∠P > m∠UJP
  3. m∠UJP = m∠1 + m∠2
  4. m∠UJP > m∠3



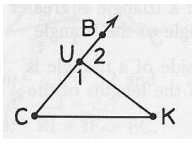
- Tell which fact (or facts) and which property of inequality can be used to prove:
  a) m∠U – mUMP > 0
  b) m∠P > m∠3

Inequalities

- RIP is an exterior angle of ΔTRI.
  - Which side of ΔTRI is the longest?

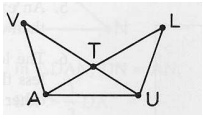


- ***Given:***
  - m∠1 > m∠2
  - ∠2 is an exterior angle of ΔUKC
- ***Prove:***
  - CK > UK



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 ΔSIP
- *Prove:*
  - $\angle 3$ is acute